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ABSTRACT

This handbook is a compendium of activities for developing physical fitness in children. The text is divided into five sections: (1) children and physical activity; (2) implementing physical fitness programs in school; (3) fitness for special populations; (4) teaching fitness for a lifetime; and (5) fitness activities and routines. These five sections give essential background information and explanations of physical fitness programs and why they are necessary. (JD)

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Fitness in the Elementary Schools

ROBERT P. PANGRAZI • DOUGLAS N. HASTAD

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A Teacher's Manual

Fitness in the Elementary Schools

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and Dance

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About the Alliance

The American Alliance for Health, Physical Education, Recreation, and Dance is an educational organization, structured for the purposes of supporting, encouraging, and providing assistance to member groups and their personnel throughout the nation as they seek to initiate, develop, and conduct programs in health, leisure, and movement-related activities for the enrichment of human life.

Alliance objectives include:

1. Professional Growth and development—to support, encourage, and provide guidance in the development and conduct of programs in health, leisure, and movement-related activities which are based on the needs, interests, and inherent capacities of the individual in today's society.

2. Communication—to facilitate public and professional understanding and appreciation of the importance and value of health, leisure, and movement-related activities as they contribute toward human well-being.

3. Research—to encourage and facilitate research research which will enrich the depth and scope of health, leisure, and movement-related activities; and to disseminate the findings to the profession and other interested and concerned publics.

4. Standards and guidelines—to further the continuous development and evaluation of standards within the profession for personnel and programs in health, leisure, and movement-related activities.

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6. To conduct such other activities as shall be approved by the Board of Governors and the Alliance Assembly, provided that the Alliance shall not engage in any activity which would be inconsistent with the status of an educational and charitable organization as defined in Section 501(c)(3) of the Internal Revenue Code of 1954 or any successor provision thereto, and none of the said purposes shall at any time be deemed or construed to be purposes other than the public benefits purposes and objectives consistent with such education and charitable status.

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About the Authors

Robert P. Pangrazi has long been involved in studying the effects of physical activity on the growth and development of young children. He is Professor and Chair of the Department of Health and Physical Education at Arizona State University and serves as a consultant to schools and universities throughout the United States. Author of many books and articles, Dr. Pangrazi has also produced six films on body movement education. He was technical director for *Bodytime*, an Emmy-award winning series on developing fitness in children that was nationally broadcast on PBS. As a concerned professional, Dr. Pangrazi is an active member of AAHPERD, a past president of the Arizona AAHPERD, and a former Executive Director of the Arizona Governor's Council on Health and Fitness.

Douglas N. Hastad is Chair of the Department of Physical Education and Associate Professor in the School of Education at Texas Christian University. He received his doctorate in Physical Education from Arizona State University, Tempe, in 1980. Hastad has been teaching since 1971, at the elementary, secondary, university, and gradute school levels. He is author or coauthor of five P.E.-related books and manuals, and has published articles in a wide variety of scholarly journals. He has also developed computer software packages, slide presentations, and audio tapes for use by physical educators. Since 1979, Hastad has conducted more than 100 workshops and presentations throughout the country on curriculum content for elementary P.E., health-related P.E. for youth, and microcomputers in P.E. and athletics, including major presentations at several recent AAHPERD national conventions.

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CHAPTER ONE

CHILDREN AND PHYSICAL ACTIVITY

Is Physical Fitness Necessary for Children?
Exercise and Health Maintenance
Exercise, Growth, and Development
Exercising Children Safely
Fitness for a Lifetime

The primary focus of this handbook is to offer a compendium of activities for developing physical fitness in children. If you feel you have a well-rounded background in physical fitness, proceed directly to Chapter 5. It contains many ideas, routines, and activities which can be implemented immediately to help improve the physical fitness level of children in your classes. If you would like a better background and a more complete understanding of physical fitness programming for youngsters, proceed through the first four chapters.

Chapter 1 deals with the reasons why physical fitness is important for the optimum growth and development of children. It contains guidelines for assuring that the program is safe and within acceptable limits for youngsters. Chapter 1 should be used as a basis for justification of the program when dealing with parents, administrators, and teachers.

Chapter 2 offers direction for building progression and overload into the program. It describes the AAHPERD Health Related Physical Fitness Test and the Physical Performance Fitness Test (Youth Fitness Test), and discusses the important differences between the two. The importance of self-testing is emphasized, and a variety of available tests are described. The final part of the chapter suggests methods of reporting test results to parents.

Chapter 3 deals with a population who need fitness most, but find it difficult to succeed: the obese, physically subpar, and handicapped. Direction for dealing with these students and adapting the program to meet their needs is offered.

Chapter 4 emphasizes the importance of teaching physical fitness for a lifetime. It is important that physical education programs teach children how to maintain physical fitness independent of a teacher. Programs often emphasize "doing something to someone" rather than teaching individuals how to maintain personal fitness. Total fitness as part of a wellness program is discussed.

This text is designed to be of immediate help in your instructional program. Bear in mind the following as you develop your program: *physical fitness is a component of a well-rounded physical education program.* At no time should skill development and cognitive learning components be discarded for the sake of offering only physical fitness experiences to children. Without adequate physical skill and knowledge, students will lack the tools needed to participate in activities which can offer fitness development.

Is Physical Fitness Necessary for Children?

This question is asked on a regular basis, usually by disbelievers. There are a number of ways to examine the question and to offer justification for physical fitness programming. The first is to look at youngsters and ask a question in return. Are they healthy? In many cases, today's children are not healthy and need physical fitness activity. Part of this problem is due to the inactivity of youngsters during the school day. Many adults observe children during recess and assume that they are extremely active. Apparently, this is not the case. In a study by Gilliam et al. (1982) it was found that children do not voluntarily engage in high intensity activity. High intensity activity is defined (see Chapter 2) as the point at which the heart rate elevates to at least 60% of its maximum. In this study, the heart rate of children was monitored to see how much time during a 12 hour period was spent in high intensity activity. Less than two percent of the time was spent by children in high intensity activity while 80 percent of the time was spent in low intensity. In addition, the researchers found that girls were even less active than boys. Obviously, children are not receiving enough fitness enhancing activity during play experiences to develop an adequate level of fitness.

In the study above, it was also shown that school decreases the physical activity patterns of children. When compared to summer activity patterns, children's activity patterns decreased during the school year. Another interesting finding showed that if girls are given the opportunity, they will increase their activity levels to be comparable or above most moderately active boys. From these results emerge two key points: fitness does not occur through unorganized recess periods, and fitness is for everybody. Physical fitness improvement can be accomplished by everyone, boys, girls, handicapped, and obese children. This contrasts with sport skills which demand a certain amount of inherent skill. Physical fitness is an easy commodity to sell children if it is based on success and self-improvement.

Exercise and Health Maintenance

A second area of concern for children's health is in the area of heart disease. It has long been thought that heart disease is of geriatric origin and only manifests itself in older adults. In a study by Glass (1973), youngsters in the Iowa public schools were examined over a two year period. Of these students, 70% had symptoms of coronary heart disease, 7% had extremely high cholesterol levels, a large percentage had high blood pressure, and at least 12% were obese. The lifestyles of children are set by their 8th birthday. Prior to this time, dietary and exercise patterns are relatively easy to change, but become increasingly more difficult to change as the youngster matures. In examining the developmental history of atherosclerosis in humans, Rose (1973) identified the first signs of heart disease appearing around the age of 2. His good news is that the disease process is reversible until the age of 19.

Wilmore and McNamara (1974) and Gilliam et al. (1977) found that more than 50% of children tested had one or more risk factors (elevated blood pressure, cholesterol levels, or obesity). The serious part of these findings lies in the fact that children with high blood pressure, lipids, and obesity tend to maintain these levels as they mature into adults. It is well documented that these factors are precursors to serious heart disease in adults thereby increasing the risk of coronary heart disease early in life.

Other detractors of physical education for children point to the fact that we have an imperfect school system. Physical education classes only meet once a week; actual fitness changes in children do not always occur; people ask, "develop physical fitness for what purpose?" It is all too apparent that the schools have many weaknesses. To avoid fitness is to avoid developing important lifestyles for adulthood. Youngsters must learn that exercising daily (independently) is an important habit for a healthy lifestyle. Certainly, we teach our youngsters how to brush their teeth in order to prevent tooth decay. How can we justify not teaching children to take a few minutes each day to assure that their total health will not decay? The justification for teaching many different ways to retain fitness (even if taught only one day per week) is that it shows that the school values health, and views exercise as an important habit.

To summarize: American youth as a whole are not sufficiently healthy. Most adults assume that if a youngster is moving, playing, and not complaining, they are healthy. The evidence points to the contrary. Youth are afflicted by symptoms of heart disease, and it appears that unhealthy children grow into unhealthy adults. Certainly, this is not a legacy we want to leave to our children. It is important to develop the patterns of healthy living now, so that children can pursue life with the odds in their favor.

Exercise, Growth, and Development

Most adults are concerned about whether their child is maturing in a normal fashion. One of the quickest ways to stimulate the concern of parents is to invite them to observe their child in a physical education setting. If it appears that their youngster is not performing on a level with other children, most will express immediate concern and ask what can be done to help the youngster improve. The following are some areas where studies have shown that exercise can enhance the growth and development of children.

Body Physique

Exercise can influence a child's body physique. The child's physique also affects a child's performance in a wide variety of physical activities. The mesomorph is characterized as having a predominance of muscle and bone and is often labeled as "athletic and muscled." These children usually perform well in most team sports because the activities require speed, strength, balance, and agility. The endomorph is characterized as soft and round with an excess of digestive organs. These are usually identified as obese children who tend to do poorly in skilled and aerobic activities. This type of child is usually at a disadvantage in all physical education activities and requires special attention (see Chapter 3). The other somatotype is the ectomorph who is identified as thin, bony, and lacking muscle tissue. This youngster may do poorly in team sport activities but could excel in aerobic activities such as distance and cross country running.

One of the reasons for examining the effect of activity on somatotype is to understand that a certain type of individual may be predisposed to certain types of activity due to the opportu-

nity to find success. If fitness programs do not offer a balanced approach emphasizing all components of fitness, the endomorphs and ectomorphs are at a distinct disadvantage. The key point: a child's somatotype offers a general indication of their predisposition to certain types of activity. Use this as a starting point for introducing and "selling" physical fitness programming.

Skeletal Growth

Strenuous physical activity has a positive effect on skeletal growth. Vigorous activity improves internal bone structure to help make the bones more resistant to breakage. The bones also grow larger in diameter and increase in mineralization in response to activity. It is well known that inactivity causes demineralization and makes the bones more susceptible to breakage.

An interesting phenomena which can have a positive effect on a child's skill performance level is caused by physical activity. Vigorous activity appears to cause the bones to shape themselves in a fashion that is mechanically advantageous for muscle attachments (Rarick, 1973). This increased mechanical advantage may allow a child to perform physical challenges at a higher level in later years when sport activities are more meaningful.

Muscles: Strength, Fiber Type, and Capability

In the elementary school years, muscular strength increases linearly with chronological age (Malina, 1980). This implies that one can expect an increase in strength fitness scores due to growth. The relative strength of children is important when pairing them for cooperative activities. Many problems can be avoided if a student is paired with someone who is similar in height and weight.

The number of muscle fibers that an individual possesses is genetically determined. An increase in muscle size is accompanied by an increase in the size of individual muscle fibers. The size of the muscles is determined first by the number of fibers and secondarily by the size of the fibers. It is important to understand that some children are genetically positioned to perform better in strength activities than others.

Skeletal muscle tissue contains fibers that are fast contracting (fast twitch [FT]) and others that are slow contracting (slow twitch [ST]) (Saltin, 1973). Most people inherit a 50:50 split, however, it can vary as much as 98:02 in outstanding athletes. The FT fibers are capable of bursts of intense activity but fatigue rapidly. The ST fibers are slow contracting and resistant to fatigue. This makes them well suited to aerobic activities which demand endurance for long periods of time. In contrast, the individual who is endowed with a high percentage of FT fibers would be capable of short bursts of intense activity which is typical of most team sport activities. This points out the need to understand that children do not all arrive at school with similar capabilities. Even though they are similar in age, they are very different physically. This emphasizes the need to offer a wide variety of physical fitness activities so that children of all types will find success at one time or another.

Strength and Motor Performance

A strong justification for physical fitness lies in the area of strength development. A study by Rarick and Dobbins (1975) identified factors which contribute to the motor performance of children. Strength in relation to body size was the factor which weighed most heavy on the motor performance of children. Youngsters who exhibit high levels of strength in relation to their body size are more capable of performing motor skills than those with lower levels of strength.

This is just one of the problems created by being obese. The more obese a child is, the less proficient a child is in performing motor skills, since obesity reduces the child's strength relative to body size. One can liken the obese child's situation to carrying a bag of sand in a backpack and trying to perform various motor skills. Body fat is dead weight which serves to reduce motor performance. Obese children may be stronger than normal-weight children in absolute terms, but they are usually weaker when their strength is adjusted for body weight. This lack of strength also causes the obese child to perceive a strength-related task as more difficult than a normal-weight child might. Teachers need to have understanding and empathy for obese youngsters; they often do not like to exercise, but they also find exercise much more difficult.

Physical Fitness Achievement and Self Concept

One of the best things about physical fitness is that every student is capable of improvement. When students can see their own improvement in fitness development, it has a strong impact on their feelings of competency. In no other area is success and failure as obvious as it is in physical education. A strong relationship has been established between self-concept and achievement (Purkey, 1980). The relationship appears to be based on the finding that people with low self-concepts do less well than would be expected based on their ability level. The low performance reinforces the poor self-concept and the cycle continues.

It is important that physical fitness experiences be arranged so that students are offered the opportunity to improve their level of performance. If workloads are set too high, the first experience is one of failure. Always arrange the dosage so that all students in the class can experience success. If the student is allowed to perform at a level which is in line with his/her ability, improvement is almost guaranteed by growth and maturation. Successful experiences can be arranged and made visible to others who are important to the student.

Physical appearance has a strong impact on how people view each other. A study by Richardson et al. (1970) shows that youngsters who possess handicaps not well accepted by society have lower self-concepts than "normal" children. Physical appearance, regardless of ability level, may negatively influence a person's self-concept. When looking at body somatotypes, the muscular body receives the highest rating from students and the obese body the lowest (Caskey and Felker, 1971). Unfortunately, students identify obese students with attributes unrelated to physique, such as "stupid, dirty, lazy, and smelly." The only area in the school curriculum devoted to physical fitness and appearance is physical education. If a youngster does not receive meaningful help in developing physical fitness, they may lose all motivation to pursue and maintain an adequate level of fitness for a lifetime.

Physical Education and Intellectual Development

Physical educators have long attempted to demonstrate a relationship between physical education and intellectual development. However, according to Shepard (1984a) "strong proof is lacking." A study which has created much interest is the Trois Rivieres regional experiment (Shephard, 1984). The study provides a well-conceived design for showing the contribution of added physical activity to the academic achievement of students throughout their primary school years. Gains in academic performance (in comparison with control group students) were statistically significant in grades 2, 3, 5, and 6. The more active students received higher grades in French, mathematics, English, and science, despite a 13% reduction in the time available for academic instruction.

Later evaluation of the study (Shephard, 1984b) found that sixth grade students who participated in provincewide examinations continued to perform better. These results appear to counter the objection that more physical education (and in turn more physical fitness) will result in poorer academic performance due to less time spent in the classroom. It is difficult to imagine how the "back to basics" proponents can argue for an increase in academic vigor at the expense of the opportunity to enhance physical fitness. Certainly there are no priorities higher than physical health; without it one is incapable of being a productive human being.

Exercising Children Safely

The focus of this section is to offer information to help teachers understand how much activity children are capable of and when environmental conditions may preclude the benefits. It is also important to have a clear understanding of the physical limits of youngsters in order to establish reasonable goals. Closely allied to this understanding should be an inherent empathy; if children think they are incapable of performing certain activities, their actual physical limits are of little concern. If children are pushed to fitness in a manner which develops negative attitudes toward lifetime fitness, the battle has been won, but the war lost.

Aerobic Capacity

Aerobic capacity, all other factors being equal, determines the magnitude of an indi-

vidual's performance in endurance oriented activities. Aerobic power is closely related to lean body mass, which explains why obese children and girls are often at a disadvantage in endurance activities. Girls tend to show an increase in body fat and a decrease in lean body weight as they mature, which causes a gradual decrease in aerobic capacity when values are adjusted by body weight (Bar-Or, 1983).

A point often raised by individuals who question endurance activities is whether training actually improves the aerobic capacity of children. The research results differ in that some studies have shown a significant increase while others have reported no improvement. It appears that, particularly in children under 10 years of age, aerobic power does not increase with training even though running performance improves. The reason for the improvement in performance is speculation, however, it is thought that children may become more efficient mechanically or may improve in anaerobic metabolism. The fact remains that children should participate in aerobic activities in order to develop meaningful fitness habits. They must understand that aerobic exercise may be the cornerstone of a lifelong fitness program.

Even though children exhibit a relatively high oxygen uptake, they do not perform up to this level because they are not economical in running or walking activities. An 8-year-old child running at 180 m per minute is operating at 90% of maximum aerobic power, while a 16-year-old running at the same rate is only at 75% of maximum. This explains why children should not be expected to perform similar to adolescents, particularly over long distances. Youngersters can run long slow distances at a slow speed.

Children are blessed in that they perceive activity to be easier than do adults exercising at a similar level. When the Rating of Perceived Exertion was administered at different percentages of maximal heart rate (Bar-Or, 1977), it was revealed that children perceive exercise to be less strenuous than do adults. The reason for this is unknown, however, much research has documented the rapid recovery rate of children, and the possibility that exercise does not demand as much of children as it does of adults. The point of application for teachers is that they should not determine workloads for children based upon their perceptions of exercise difficulty. For example, if a teacher is not fit, he or she might perceive the mile run to be next to impossible. This might not be the case for many children in a class. The important point here is to take advantage of children's rapid recovery rate. Aerobic activity can be interspersed with restful stretching and nonlocomotor movements to extend the amount of time effectively devoted to physical fitness development.

Skeletal System

The effects of exercise on the skeletal system are well documented. Bones modify their structure and hypertrophy when stress to the bones is gradually increased. Exercise is often used to prevent bone deterioration in the elderly. The key question is whether too much exercise can harm the skeletal system. In healthy children, the positive effects of physical activity outweigh any negative effects. However, if workloads are too great (resistance too great or too many repetitions) the beneficial effects of training are negated and the activity can disturb normal growth. For example, Caine and Lindner (1985) found that the growth curve for height was disturbed in two thirds of a group of young prepubescent children involved in high level gymnastics training. Overuse injuries have been reported in children in two areas: stress fractures and tendon attachments which may fail if excessive stress is applied to them. Most of these injuries appear to occur when insufficient time to heal is given after training stress has occurred. It appears that, in most cases, exercise is extremely beneficial to proper development of the skeletal system. Problems occur when excessive stress is placed on the individual without an adequate rest and recovery interval. Whereas regular exercise is important to proper growth, intense training on a daily basis is probably not beneficial to youngsters. The watchword is moderation, progression, and consistency.

Obesity and Physical Capacity

Not only does obesity affect the attractiveness of children, it takes a great toll on their aerobic power because of the greater metabolic cost of exercise. Obese children must perform at a higher percentage of their

maximal oxygen uptake. To compound the problem, their maximal uptake values are often lower than those of lean children. This gives them less reserve and makes them perceive higher exertion when performing a task. These manifestations combine to offer teachers a child who doesn't enjoy running. Teachers must understand that the obese child is working harder than a normal weight youngster. Workloads must be adjusted accordingly. All children *do not* have to do the same amount of exercise. Just as one would not expect kindergarten children to perform the same workload as fifth graders, it is unreasonable to expect obese children to be capable of workloads similar to lean youngsters.

Exercising in Warm Climates

It is important to be aware of problems which can arise from exercising children when the climate is hot, humid, or both. Children do not adapt as well as adults to extremes of temperature due to the following differences in physiology:

1. Children have a greater surface area/mass ratio than adults do. This allows a greater amount of heat to transfer from the environment to the body, thereby increasing body temperature.
2. Since youngsters are not as efficient in movement as adults, they generate more metabolic heat.
3. Sweating capacity is not as great in children as in adults, thus their ability to cool the body is less.
4. Since children have a lower cardiac output, they are less efficient at conveying heat from the body core to the skin.

These physiological differences make it clear that children are at a disadvantage when exercising in hot and humid climates. The following guidelines are offered by the American Academy of Pediatrics Committee on Sports Medicine (1983):

1. The intensity of activities that last 30 minutes or more should be reduced whenever relative humidity and air temperature are above critical levels.
2. At the beginning of a strenuous exercise program or after traveling to a warmer climate, the intensity and duration of exercise should be restrained initially and then increased gradually over a period of 10 to 14 days to allow time for acclimatization to the effects of heat.
3. Before prolonged physical activity, children should be fully hydrated. Make sure water is available if the conditions are hot and/or humid and the exercise is demanding.

Children who are obese are at an even greater risk since they are unable to dissipate heat as efficiently as a normal weight child. Stone (1977) recommends that running be restricted to periods of 15 minutes and active games consume no more than 45 minutes when the temperature is in excess of 85 degrees and the relative humidity above 40 percent. The key: go easy in the heat and gradually increase the workload.

Distance Running—How Much?

In most physical fitness programs, running forms the core of the cardiovascular endurance activities. In most cases, any running which is not competitive and where children can pace themselves—and walk if necessary—is safe, assuming the precautions discussed above are followed. Problems occur when running becomes highly competitive. When is a situation competitive for children? Anytime the teacher puts children in a setting where they are expected to win in order to receive positive feedback from the instructor and peers. Teachers often forget the tremendous pressure some children are under due to their strong desire to be accepted. The following statement from the American Academy of Pediatrics Executive Committee (1982) identifies some of the concerns teachers should understand:

> Lifetime involvement in a sport often depends on the type of early participation and gratification gained. Psychological problems can result from unrealistic goals for distance running by children. A child who participates in distance running primarily for parental gratification may tire of this after a time and quit, or the child may continue, chafing under the parental pressure. In either case, psychological damage may be done, and the child may be discouraged, either immediately or in the long run from participating in sports. A prepubertal child should be allowed to participate for the enjoyment of running without fear of parental or peer rejection or pressure. A child's sense

of accomplishment, satisfaction, and appreciation by peers, parents, and coaches will foster involvement in running and other sports during childhood and in later life.

Another view by the International Athletics Association Federation (IAAF) Medical Committee (1983) gives a similar perspective:

> The danger certainly exists that with over-intensive training, separation of the growth plates may occur in the pelvic region, the knee, or the ankle. While this could heal with rest, nevertheless definitive information is lacking whether in years to come harmful effects may result.
>
> In view of the above, it is the opinion of the committee that training and competition for long-distance track and roadrunning events should not be encouraged. Up to the age of 12, it is suggested that not more than 800 meters should be run in competition. An increase in this distance should be introduced gradually—with, for example, a maximum of 3000 meters in competition for 14 year olds.

This suggested policy might be questioned by some who feel that it is in conflict with the mile run in the AAHPERD fitness tests. The IAAF statement, however, speaks to high level competition which involves intensive pre-race training. The mile run test is offered as a form of self-competition and participants are offered the option of walking when necessary.

Fitness for a Lifetime

The key for a healthy lifestyle is developed around the word *moderation*. To date, there is no evidence to show that children are harmed by exercise when it is offered in moderation. A guiding principle is to make sure children are allowed the opportunity to make decisions about their capabilities. Too often instructors "do something" to children without allowing for the youngster's input. This process does little to help the child understand their strengths and weaknesses and may cause a great deal of frustration. The days of the "daily dozen calisthenics and run a mile" must go the way of the dinosaur. There are many paths to fitness and each individual must be allowed the opportunity to discover the approach that works best for them. If people are expected to exercise for a lifetime, they must learn activities which they enjoy and find beneficial.

This is not to suggest that the physical fitness experiences should not be demanding. It is, instead, to suggest that a youngster's feelings and self-worth should be considered at all cost. Fitness instructors must continue to emphasize the importance of nurturing and supporting students rather than embarrassing or belittling students when they find it impossible to measure up to an instructor's expectations. Youngsters find it very difficult to separate the behavior of the instructor from the content of the course. If they don't like the teacher, they probably won't like the subject matter. The instructor must develop positive relationships with students if positive feelings toward physical fitness are going to be developed.

In summary, be demanding and expect youngsters to perform. Educators have long understood that people will, to some degree, live up to expectations others have of them. Certainly, students should not be misled into believing that fitness is a relatively easy process. Fitness demands hard work and self-discipline and students should understand the process clearly. On the other hand, teachers should live up to expectations students have about them—that they are fair, understand individual differences, and care about the feelings and needs of students. Those teachers who led students to goals thought unattainable are the true heroes!

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CHAPTER TWO

IMPLEMENTING PHYSICAL FITNESS PROGRAMS IN SCHOOLS

Components of Physical Fitness
Health Related Physical Fitness
Skill Related Physical Fitness
Evaluating Physical Fitness Levels
Development of Physical Fitness
Evaluation through Student Self-Testing
Reporting Test Results to Parents

During the past decade, interest in physical fitness and increased awareness of the benefits of an active lifestyle have spawned a wide assortment of health clubs, a vast array of books and magazines concerning exercise and fitness, a weekly smorgasboard of distance runs, and an ever-increasing variety of streamlined exercise equipment. It has become fashionable for American youth to be attired in exercise apparel. Even the always-youthful Barbie doll now comes complete with her workout center, including exercise cycle, dumbbells, slant board, and locker with a towel.

The many manifestations of active ways, however, are misleading. Slowly, but effectively, the American public has been lulled into a false sense of security about the overall fitness levels in our country. The "fitness boom" may be a "fitness bust." And nowhere has this misrepresentation of adequate physical fitness been more evident than in American children. The most current national youth fitness study suggests that youngsters in grades 5-12 are becoming fatter, and are not achieving the minimum appropriate physical activity needed to maintain an effectively functioning cardiorespiratory system (Ross & Gilbert, 1985).

The nation's burgeoning enthusiasm for fitness and physical activity has not trickled down to elementary school youngsters. While statistics profiling the fitness level of children are alarming, physical education in the elementary school is at a crossroad. Responding with programs that place a renewed emphasis on physical fitness development, maintenance, and knowledge, elementary physical educators have an opportunity to offset the deterioration of children's physical fitness. By capitalizing on society's demand for physically fit youth, physical education could solidify and centralize its position in a child's total educational experience. The following sections are intended to provide the practitioner with a working definition of physical fitness, practical guidelines for fitness development and maintenance, approaches to fitness assessment and evaluation, self-testing activities for children, and methods to use physical fitness testing as an educational and public relations tool.

Components of Physical Fitness

While it is generally agreed that physical fitness is an important part of the normal growth and development of a child, a general definition regarding the precise nature of physical fitness has not been universally accepted. Through empirical research and scholarly inquiry, it is becoming increasingly clear that the multidimensional characteristics of physical fitness can be divided into two areas: health related physical fitness and skill related physical fitness. This clear differentiation between *physical fitness related to functional health* and *physical performance related primarily to athletic ability* has come about only after much discussion and debate. While this distinction has curricular implications, classifying fitness into two categories should not lessen the importance of either in the total growth and development of youngsters. Understanding the distinctive features of the components comprising health related physical fitness and skill related physical fitness should help educators develop objectives and goals for elementary physical education.

Health Related Physical Fitness

Health related physical fitness includes those aspects of physiological function which offer protection from diseases resulting from a sedentary lifestyle. It can be improved and/or maintained through properly directed physical activity. Specific components include cardiovascular fitness, body composition (ratio of leanness to fatness), abdominal strength and endurance, and flexibility. These components, essential in developing and maintaining the physical health and well-being of children, can be measured by the *AAHPERD Health Related Physical Fitness Test* (1980).

Cardiovascular fitness is the ability to exercise the entire body for extended periods of time without undue fatigue. A strong heart is necessary to effectively supply oxygenated blood to the muscles of the body. Poor cardiovascular fitness has been identified as an antecedent to heart disease.

Body composition speaks to the amount of body fat a person carries. A fit person has a relatively low percentage of body fat. Obesity has been linked with the onset of various health problems.

Strength is the ability of muscles to exert force. *Endurance* is the ability of muscles to exert force over an extended period of time. Maintenance of minimal levels of trunk and hip

strength/endurance are important in the prevention and alleviation of low back pain and tension.

Flexibility is the range of motion available in a joint or a sequence of joints. Muscles, tendons, and ligaments tend to retain or increase their elasticity through stretching activities. People who are flexible are less subject to injury during physical activity, usually possess sound posture, and may have less back pain.

Skill Related Physical Fitness

Skill related fitness includes those physical qualities which enable a person to perform sport better. Synonymous with skill fitness is athletic fitness or motor fitness. In addition to the health related aspects which are important to sport performance, specific components making up skill related fitness are agility, balance, coordination, power, and speed. Skill related fitness components, useful in performing motor tasks related to sport and athletics, can be measured by the *AAHPERD Youth Fitness Test* (1976).

Agility is the ability of the body to rapidly and accurately change position while moving in space. Wrestling and football are examples of sports that require agility.

Balance refers to the body's ability to maintain a state of equilibrium while remaining stationary or moving. Maintaining balance is essential to all sports, but is especially important in the performance of gymnastic activities.

Coordination is the ability of the body to smoothly and successfully perform more than one motor task at the same time. Needed for football, baseball, tennis, soccer and other sports which require hand-eye and foot-eye skills, coordination can be developed by repeated practice of the skill to be learned.

Power is the ability to explosively transfer energy into force. To develop power, a person must practice activities which improve strength, but at a faster rate, involving sudden bursts of energy. Skills requiring power include high jumping, long jumping, shot putting, throwing, and kicking.

Speed is the ability of the body to move in a short period of time. Usually associated with running forward, speed is essential for the successful performance of most sports and general locomotor movement skills.

Fig. 2.1. Suggested activities to improve health related physical fitness.

Component	Activities
Cardiovascular Fitness:	Jogging, Cross-Country Skiing, Walking, Continuous Rope Jumping, Bicycling, Swimming, and Aerobic Dance.
Body Composition:	(same as Cardiovascular Fitness)
Abdominal Strength and Endurance:	Sit-ups, Variations of the Sit-up, Selected Animal Walks, Stretching and Twisting.
Flexibility of Lower Back:	Bending and Stretching, Sitting Stretch, Partner Stretching, and Selected Animal Walks.

Fig. 2.2. Suggested activities to improve skill related physical fitness.

Component	Activities
Arm & Shoulder Girdle Strength:	Pull-ups, Variations of the Pull-up, Rope Climbing (hands only), and Selected Animal Walks.
Abdominal Strength & Endurance:	Sit-ups, Variations of the Sit-up, Selected Animal Walks, Bending, Stretching, and Twisting.
Agility:	Selected Stunts, Zig-Zag Run, Selected Sports Skills.
Leg Power:	Treadmill, Vertical Jumping, Running, and Standing Long Jump.
Speed:	Tortoise and Hare, Running in Place, Selected Leg Exercises.
Coordination:	Locomotor Movements, Selected Object Manipulation Skills, and Most Sports Skills.
Balance:	Movements on Benches or Balance Beam, Selected Balance Stunts, and Nonlocomotor Tasks.

Evaluating Physical Fitness Levels

Valid reasons for measuring childrens' physical fitness are many and varied. The evaluation process is further complicated by the proliferation of test items devised to measure various components of physical fitness. With the acceptance of a clear distinction between health related and skill related fitness, it is important to focus our attention on test batteries which best measure respective components of each. To obtain valid and reliable results which can be accurately and meaningfully interpreted, we suggest utilizing the *AAHPERD Health Related Physical Fitness Test* (1980) and the *AAHPERD Youth Fitness Test* (1976). All components of health related physical fitness and most components of skill related fitness are measured by one or more of the respective test items. Utilizing a battery of tests will provide the student with an overall appraisal of their current health or skill related fitness status. The following sections briefly describe the content of each test and selected activities that can be used to improve level of performance. Activities to improve fitness are more thoroughly explained in Chapter 5.

AAHPERD Health Related Physical Fitness Test

The following description of test items has been condensed from the *AAHPERD Health Related Physical Fitness Test Manual* (1980).

Distance Runs

The purpose of the distance runs is to measure maximal function and endurance of the cardiovascular-respiratory systems. The importance of measuring cardiovascular-respiratory fitness lies in the fact that heart disease is the leading cause of death in our society, and risk factors associated with the onset of heart disease have been identified in children. Being able to assess and evaluate the functioning of the cardiovascular system through field tests is valuable in determining the type and amount of exercise needed to develop and maintain a strong heart and lungs.

For children ages 5-12 years, a one mile run for time (to the nearest second) or a 9-minute run for distance (to the nearest 10 yards) have been selected. The decision as to which test to use should be based on available facilities, equipment, time limitations, administrative considerations, and personal preference of the test administrator. Any smooth, flat, safe area where distance can be accurately measured may be used for testing. Using children in the intermediate grades (4-6) as lap counters and recorders can relieve the teacher of some administrative burdens and contribute to a positive running environment for youngsters in the primary grades (K-3).

Prior to engaging in the distance run test, children should receive ample instruction and practice in running for distance. Particular emphasis needs to be placed on the concept of pace. The purpose of the test should be explained to the youngsters and steps taken to ensure a high level of motivation. Children with known medical problems which would contraindicate vigorous exercise should be excluded from the test.

Skinfold Test

The purpose of the skinfold test is to evaluate the percentage of body fatness. Measuring millimeters of skinfold thickness is the most reliable and valid field test to determine total body fatness. Regular monitoring of body fat can greatly assist the practitioner in structuring special exercise programs to meet the needs of normal and obese children. (See Chapter 3 for a suggested program for obese children.)

A skinfold is a double layer of skin and underlying fat. Two sites, the triceps and subscapular, have been chosen because each is easily measured and the sum of both is highly correlated with total body fat. The triceps skinfold is a vertical pinch measured over the triceps muscle of the right arm at a point midway between the elbow muscle of the right arm at a point midway between the elbow and the tip of the shoulder. The subscapular site is also taken on the right side of the body and is measured 1/2 inch below the inferior angle of the scapula following the natural lines of the fold. An accurate caliper is recommended for taking these measurements, however, some of the cheaper plastic calipers are acceptable.

Practice in skinfold measurement is necessary to ensure reliable and accurate scores. Proper technique includes accurately locating the site, firmly grasping the skinfold between thumb and forefinger and lifting it away, plac-

Fig. 2.3. Measuring the triceps skinfold.

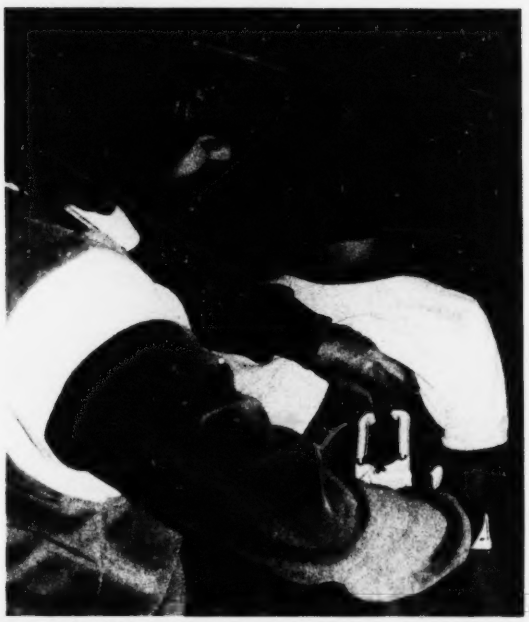


Fig. 2.4. Measuring the subscapular skinfold.

ing the caliper 1/2 inch below the skinfold, slowly releasing the pressure on the caliper trigger so that full tension can be exerted on the skinfold, and then reading the scale.

Skinfold assessment is measured to the nearest 0.5 millimeter with the middle score of three trials being recorded. National percentile equivalents are available for triceps skinfold and sum of skinfold. A more meaningful interpretation of skinfold measurements for students and parents may be obtained by converting the sum of skinfolds into an estimate of percent body fat (Lohman, 1983).

Fig. 2.5. Estimates of percent body fat from two-site skinfold boys and girls ages 6-12 years.*

Sum of Triceps & Subscapular (mm)	% Fat Boys	% Fat Girls
8	5.63	7.63
9	6.78	8.78
10	7.90	9.90
11	9.00	11.00
12	10.07	12.07
13	11.12	13.12
14	12.15	14.15
15	13.15	15.15
16	14.13	16.13
17	15.08	17.08
18	16.01	18.01
19	16.92	18.92
20	17.80	19.80
21	18.66	20.66
22	19.49	21.49
23	20.30	22.30
24	21.09	23.09
25	21.85	23.85
26	22.59	24.59
27	23.30	25.30
28	23.99	25.99
29	24.66	26.66
30	25.30	27.30
31	25.92	27.92
32	26.51	28.51
33	27.08	29.08
34	27.63	29.63
35	28.15	30.15
36	28.65	30.65
37	29.12	31.12
38	29.57	31.57
39	30.00	32.00
40	30.40	32.40
41	30.78	32.78
42	31.13	33.13
43	31.46	33.46
44	31.77	33.77
45	32.05	34.05
46	32.31	34.31
47	32.54	34.54
48	32.75	34.75
49	32.94	34.94

*Estimates of % Fat are calculated from equation derived by Lohman and colleagues (1983) and reported in *AAHPERD Technical Manual on Health Related Physical Fitness* (pg. 18).

Modified Sit-ups

The purpose of the sit-up is to measure abdominal muscular strength and endurance. The number of successfully completed sit-ups is a good indicator of not only abdominal strength and endurance, but also functioning of the lower back.

The child is positioned in a supine position with the legs bent at the knees, feet flat on the floor, and the heels between 12 and 18 inches from the buttocks. Arms should be folded across the chest with hands on opposite shoulders. The forearms must remain in contact with the chest throughout the complete curl. The head is tucked with the chin to the chest. A partner holds the feet on the floor and counts the number of correctly executed sit-ups. The child curls to a sitting position until the elbows touch the thigh. A successful sit-up is completed when the midback makes contact with the testing surface.

Fig. 2.6a. Starting position for sit-up (sequence 1 of 2), AAHPERD Health Related Physical Fitness Test.

Fig. 2.6b. Up position for sit-up (sequence 2 of 2), AAHPERD Health Related Fitness Test.

Mats or individual carpet squares are recommended for comfort. The total number of correctly executed sit-ups in one minute is the score. The modified sit-up should be regularly included in youngsters' planned physical activity.

Sit and Reach

The purpose of the sit and reach is to measure the flexibility of the low back and posterior thigh. Measuring the distance a person can sit and reach is important in determining the functioning of their lower back and posterior thigh region. A special apparatus, made from a box with a measuring scale, is required for this test. The child assumes a sitting position with legs extended, feet shoulder width apart, shoes off, and feet flat against the apparatus. The arms are extended forward with the hands one on top of the other, finger tips on top of finger nails. The child reaches directly forward, palms down on the surface of the scale four times, holding the position of maximum reach the last time for one full second. The score is the most distant point reached, measured to the nearest centimeter. The legs must remain straight throughout the entire trial. Only one trial is given. Care should be taken to provide youngsters with adequate warm-up and stretch time prior to taking the test.

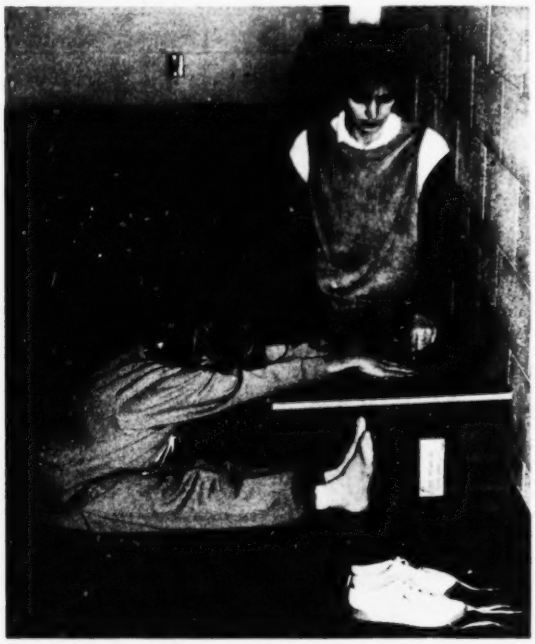


Fig. 2.7. Sit and reach test for flexibility.

Fig. 2.8. Example of raw data card for AAHPERD Health Related Physical Fitness Test.

School Year: _____ Classroom Teacher _____

Name _____ Age _____ Birthdate _____ Grade _____

Dimensions (opt.)		**Fitness Test**	
Height	_____	Sit-ups	_____
Weight	_____	Sit and Reach	_____ cm.
		Triceps	_____ mm.
		Subscapular	_____ mm.
		Sum of Skinfold	_____ mm.
		Mile Run Time	_____
		Distance	_____

Lap Times Using 220 Yard Oval

Lap #1	_____	Lap #5	_____
Lap #2	_____	Lap #6	_____
Lap #3	_____	Lap #7	_____
Lap #4	_____	Lap #8	_____
Mile Run Time	_____	In Seconds	_____

AAHPERD Youth Fitness Test

The following description of test items has been condensed from the *AAHPERD Youth Fitness Test Manual* (1976).

Pull-up (Boys)

The purpose of this test is to measure arm and shoulder girdle strength in boys. Since arm and shoulder girdle strength is important for the performance of many motor skills, regular assessment of the capability of this particular group of muscles is important.

The student grasps a metal or wooden bar (approximately one and one-half inches in diameter), in an overhand grip position with palms facing away from the body, and hangs with arms and legs fully extended. His feet should be free of the floor. From this hanging position and without swinging or bending the legs, the child pulls the body upward until the chin can be placed over the bar and then returns to the starting position. The exercise is repeated as many times as possible. Only one trial is allowed.

Flexed Arm Hang (Girls)

The purpose of this test is to measure arm and shoulder girdle strength in girls. Since arm and shoulder girdle strength is important for the performance of many motor skills, regular assessment of the capability of this particular group of muscles is important.

The child is placed at a horizontal bar and

uses an overhand palms away grip to hold the body in a position where the chin is above, but not touching, the bar. A stopwatch is started once this position is attained and is stopped when the chin either touches the bar, falls below the level of the bar, or maintains its height by tilting the head backward. The score is the number of seconds the child successfully holds the hanging position.

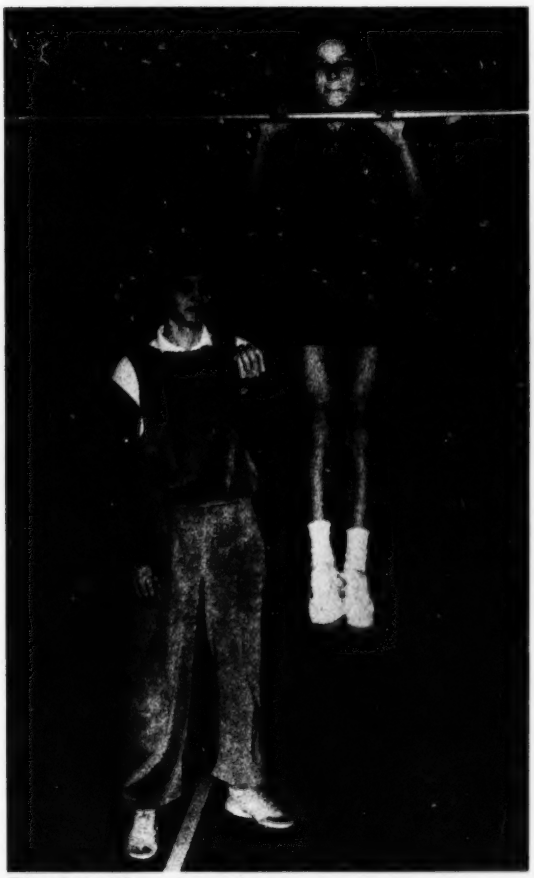


Fig. 2.9. Flexed arm hang.

Sit-up

The purpose of this test is to measure strength and endurance of the abdominal muscles. The number of successfully completed sit-ups is a good indicator of abdominal and overall strength and endurance.

The youngster lies in a supine position with knees flexed and heels approximately 12 inches from the buttocks. The child clasps fingers behind the back of the neck and places the elbows flat on the testing surface. Feet are held at the ankles by a partner. A sit-up is successfully completed when the student is able to curl-up and touch elbows to knees. The number of sit-ups completed in one minute determines the score.

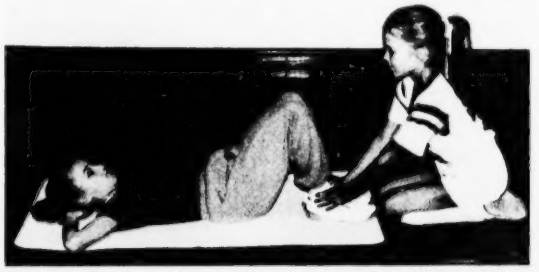


Fig. 2.10. Starting position for sit-up (sequence 1 of 2), AAHPER Youth Fitness Test.

Fig. 2.11. Up position for sit-up (sequence 2 of 2), AAHPER Youth Fitness Test.

Shuttle Run

The purpose of this test is to measure speed and agility. This test assesses those components of fitness important to the performance of skills requiring quick and accurate movement of muscles.

Two blocks of wood (2" x 2" x 4") are placed side by side on a line 30 feet from the starting line. On command, the child runs from behind the starting line to retrieve one of the blocks. After placing it behind the starting line, the student runs to pick up the second block which he carries back across the starting line. The time taken to correctly retrieve both blocks is recorded in seconds. The best time of two trials is the child's score.

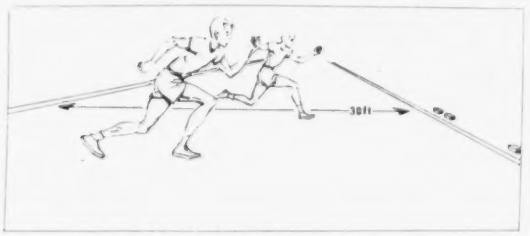


Fig. 2.12. Starting the Shuttle Run.

Standing Long Jump

The purpose of this test is to measure leg power. Some experts also contend that, with children, successful performance on this test is dependent more on proper coordinated use of the arms with the legs than power in the legs. Performance on the standing long jump is often used to determine potential for successful performance in selected sport skills.

The child stands with feet apart and toes behind a take-off line and is asked to jump as far as possible. Performance can be enhanced by synchronizing leg and arm motion. Distance is measured in feet and inches from the takeoff line to the landing point nearest the takeoff line. The best of three trials is recorded.

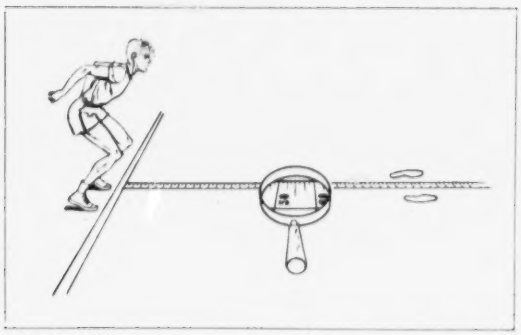


Fig. 2.13. Measuring the Standing Long Jump.

50-yard Dash

The purpose of this test is to measure forward running speed. Perhaps the most valid field test for predicting speed, performance in the fifty-yard dash is also useful for ability grouping.

The pupil takes a position behind a starting line and, on command, runs 50 yards. The amount of time elapsed between the start and the moment the child crosses the finish line will be the recorded score. Time is reported to nearest tenth of a second.

600-yard Run (Options include the 1-mile or 9-minute run)

The purpose of this test is to measure cardiovascular fitness. Many experts feel that the 600-yard run is not a valid predictor of cardiovascular fitness. However, it is sometimes used to measure cardiovascular fitness in obese children who display exceptionally low levels of cardiovascular fitness.

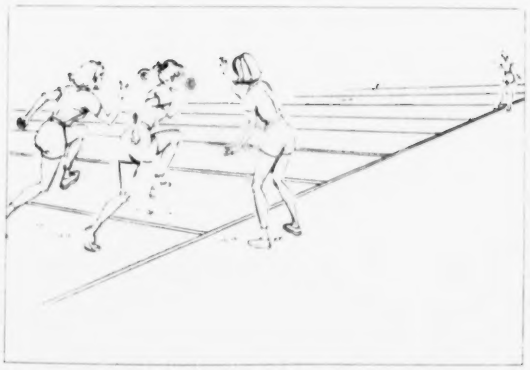


Fig. 2.14. Starting the 50-Yard Dash.

The student is instructed to run/walk 600 yards as fast as possible. The score is recorded in minutes and seconds. Explanations of the 1-mile and 9-minute can be found earlier in this chapter under the description of the *AAHPERD Health Related Physical Fitness Test.*

Development of Physical Fitness

The physical education program should provide children with the opportunity to develop and maintain a level of physical fitness commensurate with their needs. Positive changes in physical fitness result from participation in exercise routines which adhere to principles of exercise. Developmental experiences which address all components of fitness and adhere to the principles of exercise should be included as a separate portion of physical education lesson. Chapter 5 details fitness routines and exercises which can be incorporated into the daily lesson.

Guidelines for Developing Physical Fitness

If we want children to be physically fit and adopt a physically active lifestyle, educational experiences must be broad and well-planned. There is much more to developing and maintaining physical fitness in children than just including exercise as part of the program. Physical fitness is neither a by-product of physical education, a chance occurrence, nor a commodity measured only by performance scores. Children should acquire the basic concepts of fitness, learn the value of regular exercise, begin taking responsibility for their own physi-

cal well-being, and, of course, regularly experience vigorous physical activity. A balanced approach toward fitness experiences is essential if fitness is to be extended beyond the confines of the gymnasium.

Physical fitness is not simply a by-product of physical education. Teachers must follow selected principles of exercise if the physical fitness levels of children are to be improved and maintained.

Frequency, Intensity, Time (FIT)

The acronym FIT can be used to remember the three most important principles of exercise: frequency, intensity, and time.

Frequency refers to regularity of exercise. The number of days per week that a youngster is involved in vigorous physical activity is used to determine frequency. Children should be involved in vigorous physical activity 3-5 days per week.

Intensity refers to how much effort is expended during exercise. The method of determining intensity is dependent on the component of fitness exercised. For instance, cardiovascular effort is measured by heart rate; the degree of above normal exertion indicates how hard muscles are working; and distances of beyond normal stretching are used to measure intensity of flexibility activities. Fitness benefits can be derived when children work at 60%-90% of their working heart rate. Figure 2.15 shows suggested exercise target heart rates for children.

Fig. 2.15. Estimates of target heart rate zone for children.

Resting Heart Rate	Threshold or 60% of Working Hr.	Upper Limit or 90% of Working Hr.
Below 60	150	196
60-64	151	196
65-69	153	196
70-74	155	196
75-79	157	198
80-84	159	198
85-89	161	199
90 & Over	163	199

Time refers to length of an exercise period. Usually measured in minutes, this time of exercise involvement is also referred to as exercise duration. The fitness modules described in Chapter 5 can be varied to accommodate the length of the time available for fitness development. Ten to fifteen minues of sustained vigorous activity (including warm-up) is the recommended minimum time for an exercise period.

Other principles of exercise to be considered when structuring fitness routines are progression, warm-up, mode of activity, specificity, and initial level of fitness.

Progression

Progression refers to the sequencing of exercise and usually involves manipulation of FIT to prevent some of the negative aspects associated with fitness activities. Muscle soreness and the early onset of fatigue initially may cause children to balk at high intensity activity. Since it is common for a child's level of physical fitness to deteriorate during the summer months (if fitness has been developed during the school year), fitness routines for the first several weeks of school should be reduced in intensity and progressively increased thereafter. If there is a need for additional energy expenditure, the frequency and time factors can be increased accordingly. In school programs where frequency and time may be limited, a gradual increase in intensity is the only alternative. There is little evidence available outlining a "best" implementation strategy for progression. A general recommendation would be to increase the workload by no more than 10% per week. Whatever the case, a conservative approach is best, in order to foster a positive attitude toward exercise which will last a lifetime.

Warm-up

Warm-up is an initial period of physical activity used to prepare the youngster for the vigorous exercise that follows. Proper warm-up and stretching may help prevent muscle and joint soreness and give the respiratory and circulatory systems a chance to adapt. Activities should be unstructured (i.e. no new skills are introduced) and should consist of gross movements which utilize the large muscle groups. This gradual progression into activity makes the children more comfortable as they get ready for the more intense phase of the lesson.

Mode of Activity

Mode of activity describes the types of activity which are conducive to fitness development. It is important to remember that any activity which can be adapted to comply with FIT standards is appropriate. The most common fitness activities are jogging, general exercise, walking, swimming, bicycling, cross-country skiing, and aerobic dance. Chapter 5 details specific fitness routines for children.

Specificity

Specificity refers to developing a particular component of fitness through specifically designed exercises of proper FIT. For example, if the desired outcome is improved abdominal strength, then the exercise(s) selected must work the abdominal muscles. The specificity principle means that it is essential to carefully plan fitness routines which will elicit the desired improvements in fitness. Exercises to develop specific components are described in Chapter 5.

Initial Level of Fitness

Initial level of fitness refers to the variation of fitness exhibited by children. The continuum of fitness extends from those with low levels of physical function/ability to youngsters with high levels of physical function/ability. Strategies must be developed which offer children at both ends of the continuum opportunities to profit from the benefits of exercise without being discouraged or frustrated. Fitness activities must be individualized to accommodate the manipulation of intensity.

Evaluation Through Student Self-Testing

One of the primary challenges related to fitness development is to assist children in acquiring the necessary skills to solve their own fitness problems. To accomplish this means that students need to acquire an understanding of the how and why of fitness and be able to assess and evaluate their personal level of physical fitness. While formal test batteries are useful for periodically assessing performance, introducing self-testing activities arms the student with the knowledge necessary to conduct fitness assessment, evaluation, and prescription during nonschool times.

Selecting self-testing activities should be based on several criteria. First of all, self-tests should measure components of fitness which are perceived as important to the individual. Valuable fitness factors should be discussed in class prior to self-testing activities. Components which affect the child's physical health and well-being fall into this category.

Secondly, raw scores achieved from self-tests should be understandable and readily translatable into meaningful information. Children need immediate feedback regarding their performance. Scoring procedures which are easily understood and quickly converted into percentile equivalents via readable tables or microcomputer software are recommended.

Finally, self-testing activities should have the potential to be conducted outside the physical education classroom with minimal instruments or inconvenience. Children should be encouraged to complete self-appraisals in a variety of settings outside school.

The following are examples of suggested self-testing activities.

Cardiovascular Fitness

Kasch Pulse Recovery Test

Purpose: to determine heart rate recovery.

Equipment: a bench 12" high; watch or clock with second hand.

Instructions: step on and off the bench at a rate of 24 steps per minute for three minutes. Sit down and relax for five seconds. Then take your pulse rate at either the wrist or carotid artery for 60 seconds and record it. Refer to the chart below to evaluate level heart rate recovery.

Fig. 2.16. Pulse rate table for 6-12 year olds.

Fitness Levels	Boys	Girls
Excellent	73-82	81-92
Good	83-92	93-104
Average	93-103	105-118
Fair	104-113	119-130
Poor	114-123	131-142

Mile Run

Purpose: to measure cardiovascular fitness.

Equipment: any area which is flat, free of

debris, and accurately measured; watch or clock which measures minutes and seconds.

Instructions: see discussion on page 00.

Body Composition

Skinfold Test

Purpose: to determine percentage of body fat.

Equipment: skinfold caliper. An effective homework assignment might be to have students make a caliper by tracing the pattern below and applying it to a cardboard backing.

Instructions: Follow directions as found in the *AAHPERD Health Related Physical Fitness Test Manual*. Refer to the table on page 00 to convert millimeters of sum of skinfold to percentage of body fat.

A Suggested Self-Testing Approach

One of the easiest ways to teach students the process of self-testing is to allow them an opportunity to work with a friend for the purpose of testing and recording scores. Allow students to pick a friend with whom they feel comfortable in physical performance activities. This both reduces personal embarrassment and the inclination to record false scores.

Four or five times a year, give students their self-testing card and allow them to test themselves. Figure 2.18a is an example of a card which can be used for recording scores on the *AAHPERD Health Related Physical Fitness Test*. Note that a disclaimer is added so that when parents review the card they will understand that the results have been gathered by the youngsters and are not official results. Charts can be posted which convert the raw scores to percentiles so students can see how their score compares with other students.

Fig. 2.17. Self testing body composition.

Fig. 2.18a. Personal record sheet—Health-Related Fitness Test*

Name _____ Grade _____ Room # _____ Age _____

School _____ School ID. # _____

	Trial 1		Trial 2		Trial 3		Trial 4	
	Date _____		Date _____		Date _____		Date _____	
	Score	%ile	Score	%ile	Score	%ile	Score	%ile
Distance Run (1 Mile)	_____	_____	_____	_____	_____	_____	_____	_____
Skinfold (mm)	_____	_____	_____	_____	_____	_____	_____	_____
Sit-Ups (In 60 sec.)	_____	_____	_____	_____	_____	_____	_____	_____
Sit/Reach	_____	_____	_____	_____	_____	_____	_____	_____

*Parents: Please note that results are not official scores.
This is a self-testing program in which students evaluate each other.

make and use your own skinfold caliper

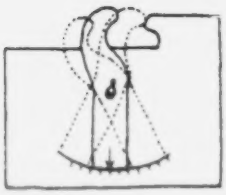


Fig. 2.18b

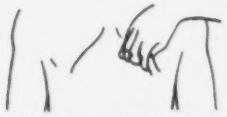
YOU'LL NEED:

Tracing paper, pencil, thumbtack, cardboard, and eraser.

THEN:

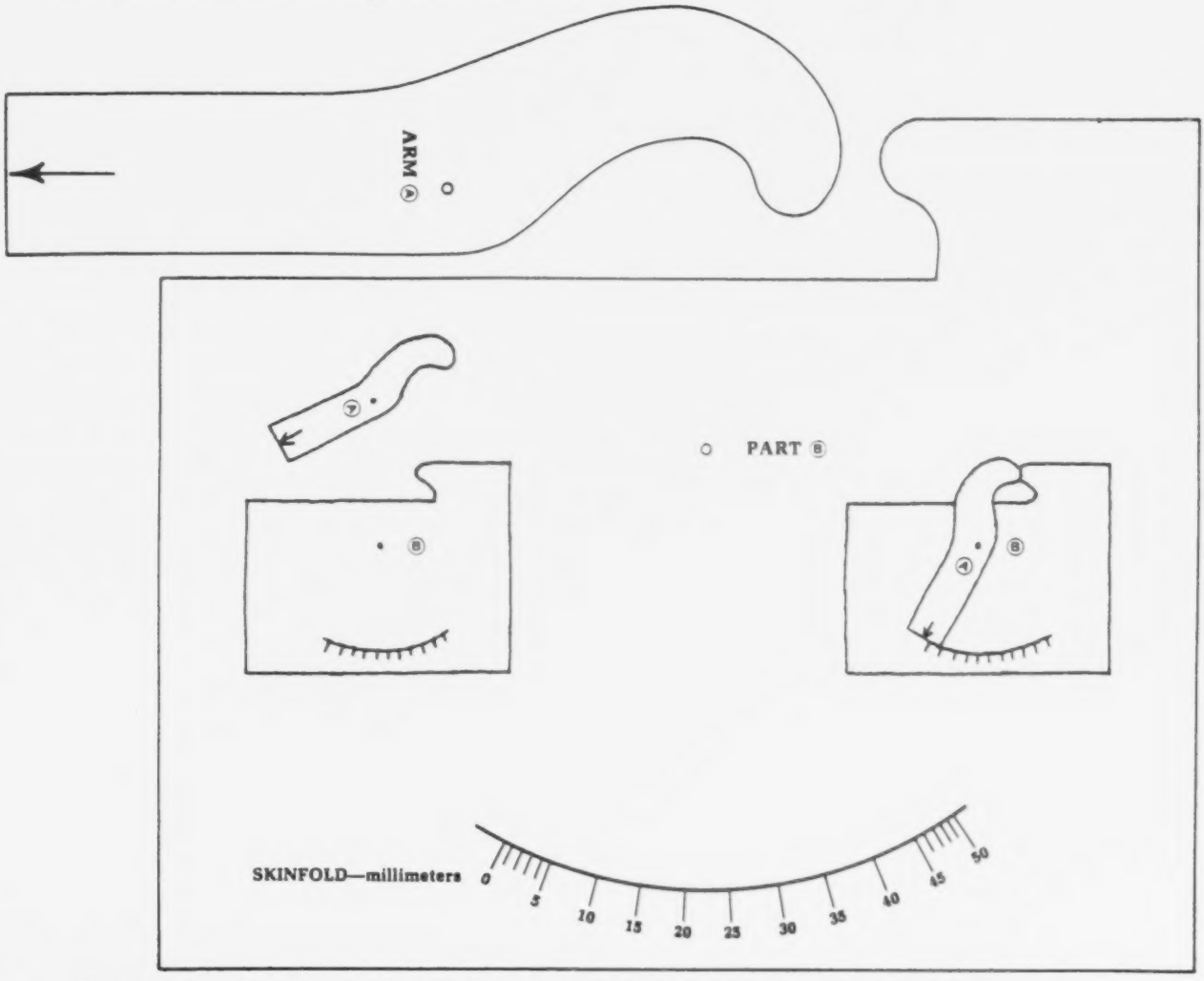
1) Make your caliper by tracing the pattern below and transferring it onto some cardboard. Once the parts are cut out, a simple pivot can be made by sticking a straight pin or thumbtack through the hole marks and into an eraser.
2) Now get a partner. Take the following measurements:

a) **Triceps** Stand relaxed, arms at your sides. First your friend squeezes the loose flesh at the back of your arm, opposite your biceps, about half-way between your elbow and your shoulder. Your friend must hold the fold of flesh with the thumb and forefinger of one hand while measuring it with the caliper in the other hand. The caliper should make a slight dent in the flesh. Holding the skinfold and working the caliper can be a bit tricky, so it's best to take three measurements and then figure the average of all of them.



b) **Subscapular** Have your friend measure a skinfold just below the shoulder blade. The fold should be at a 45° angle to the vertical. Again, take three measurements and figure the average. Now add the averages you got in each of the two tests. Locate your number on the chart on page 58. Next to it you'll find the percentage of fat in your body for your age.

3) Remember, these are only estimates. It is best to record your total millimeters of fat. Then after you have exercised for 12 weeks, check your total millimeters again. The total should be lower if you have exercised at your target heart rate level for 30 minutes or longer, four or more times a week.



Source: From Kuntzleman, C. T. (1980). *The Beat Goes On.* Arbor Press: Arbor, Michigan.

It is possible to organize the self-testing day so that students can perform sit-ups, skinfold measurements, and the sit and reach tests all in one day. The mile run can then be done as a group test, where students record their own time by watching a large timing clock. The strength of this approach is that students learn to take skinfolds, measure the various components of fitness, and interpret the results. The scores gathered should be of concern only to the individual student and parents, and should not be used for comparative purposes among students.

Reporting Test Results to Parents

Physical fitness testing can serve as a good public relations tool for physical education. Elementary physical education has a unique opportunity to capitalize on the current high level of public awareness regarding the value of physical fitness. And nowhere can physical education gain a stronger base of support than with parents. Keeping parents informed about physical fitness testing is critical to the success of any program. Strategies to apprise parents of ongoing fitness testing activities include educating, involving, and reporting.

Presenting the rationale for physical fitness and related activities is the initial step in educating parents about fitness testing. An excellent method for educating parents is through their children. Youngsters who are knowledgeable about physical fitness are likely to be the best campaigners for a quality physical education program. A planned evening demonstration is another opportunity to tell parents about the importance of physical fitness as well as demonstrate how physical fitness is being incorporated into physical education. Physical education newsletters and/or personal letters discussing physical fitness topics can be sent periodically to parents.

Any fitness testing usually requires a great deal of the teacher's time and effort. Finding competent individuals to assist in various phases of testing is not always easy. Involving interested parents with the administration of fitness testing may be an effective alternative to professional assistance. More importantly, becoming familiar with fitness testing through firsthand involvement answers many questions parents may have about the physical capabilities of children. To many parents, for example, the thought of their child running one mile is alarming. Witnessing children successfully complete a mile run without stopping may cause parents to view the distance run test much more positively.

All testing procedures should include a follow-up report to parents. The report should include an explanation of test items, raw scores, percentile equivalents (with an explanation of how to interpret percentiles), and prescriptive activities to enhance fitness deficiencies.

The microcomputer is rapidly becoming a popular tool for assisting the practitioner in the recording and reporting of physical fitness scores. In addition to reducing the time usually required for organizing raw scores, the microcomputer (with an accompanying graphics printer) is capable of producing personal, easy to interpret, and meaningful fitness reports. Several software programs are currently available which evaluate and graphically profile the physical fitness level of children. Figure 2.19 is a screen from the Apple computer software

Fig. 2.19a. Students generating personalized fitness profile.

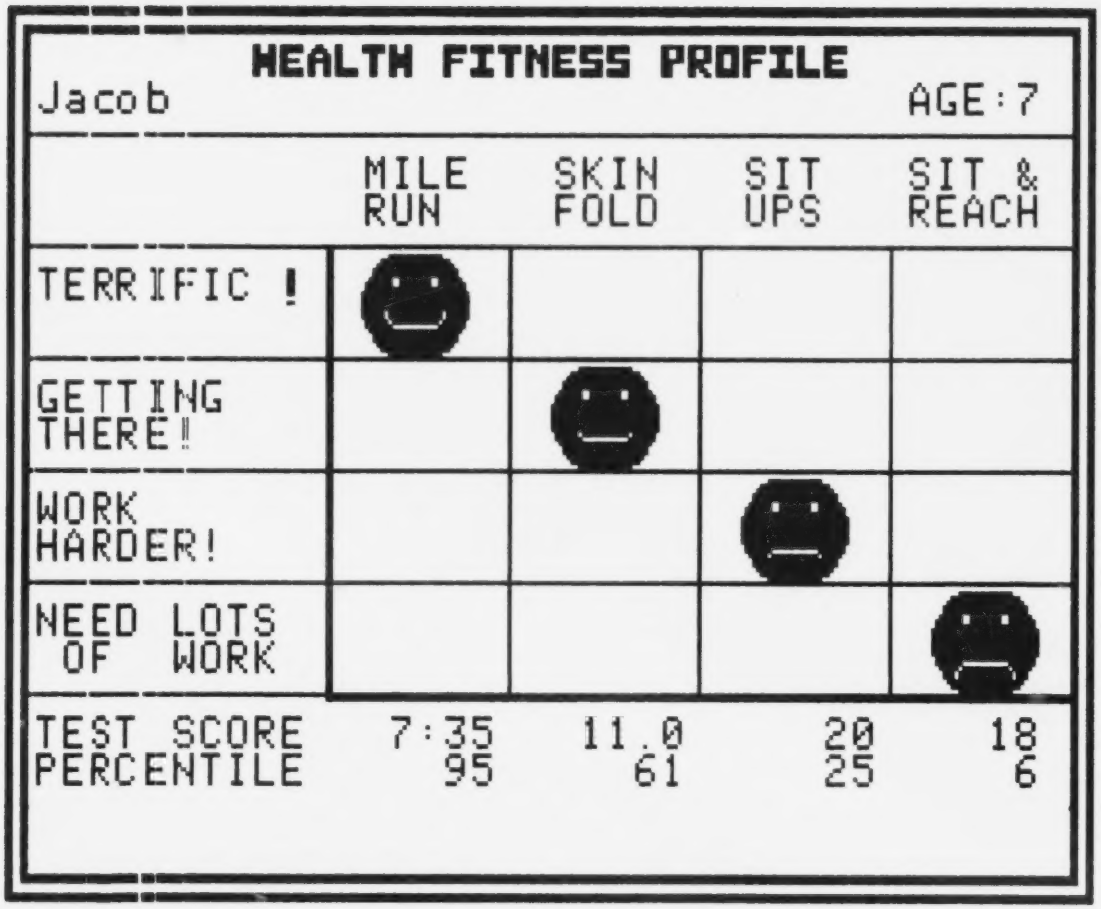


Fig. 2.19b

Source: From Hastad, D. N. and Plowman, S. A. (1985). *The Health Fitness Profile for Children Ages 6-12.* CompTech Systems Design: Hastings, Minnesota.

program, *Health Fitness Profile for Children* (Hastad & Plowman, 1985). It illustrates how test results can be graphically depicted, and is ideal for keeping parents informed about their youngster's fitness. Intended for use by children, this program automatically compares *AAHPERD Health Related Physical Fitness Test* scores with national norms and offers a printed exercise prescription. AAHPERD Publications offers a variety of microcomputer software packages which can assist in the collection and reporting of fitness scores.

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CHAPTER THREE

FITNESS FOR SPECIAL POPULATIONS

Obese Children
Implementing a Program for Obese Youngsters
Assigning Activity
Fitness for Handicapped Children
Integrating Special Students into
Physical Education Classes
Modifying Participation

Fitness is important for everyone. One of the problems educators are facing today is the many exceptions which must be made for youngsters with special problems, i.e., obesity, subpar strength, mental retardation, etc. Fitness has, in the past, been seen as the domain of the athletic and gifted. Fortunately, the belief that fitness is a need and right of all people is becoming more widespread. Methods and procedures for adapting fitness activities to the special needs of these children will be the focus of this discussion.

Obese Children

Obesity affects 30 to 50 percent of the American population, depending on how it is defined. It is probably the most widespread handicap facing children today. One of the unfortunate myths associated with obesity is that youngsters will grow out of the condition when they enter adolescence. Sadly, this doesn't occur. What does happen is that children grow more deeply into obesity to a point where the problem becomes almost impossible to rectify. Research indicates that 28 of 29 teenagers who are obese will become obese adults (Johnson, 1956).

The typical triangle of treatment for obese children has been counseling, diet control, and exercise. It is difficult to find the opportunity for counseling in most elementary schools, and diet control is really not possible unless the parents' diet can be controlled. This leaves exercise and increased activity as the major focus in the treatment of obesity. Many studies have demonstrated that inactivity is the key factor in obesity. Bullen, et al. (1964) filmed adolescent girls participating in camp activities consisting of swiming, tennis and volleyball. One group of girls was normal weight and a second group obese. The motion pictures were later analyzed to measure the amount of activity each group demonstrated. Activity was classified as other than lying, standing, or sitting. When the two groups were compared, it was found that the obese group was two and a half times less active in swimming and tennis, and one and one half times less active in volleyball as compared to the nonobese group. The researchers concluded that inactivity is a significant factor in perpetuating obesity.

Corbin and Pletcher (1968) conducted a similar study in which they analyzed diet and activity patterns of obese and nonobese elementary school boys and girls. They found similar patterns of inactivity as did Bullen, et al., (1964) and concluded that "inactivity may be as important or more important than excessive caloric intake in the development and maintenance of childhood obesity." A related finding was that diets were similar among all children regardless of body fat proportions.

Many people have not taken exercise as a serious factor in weight control since they read that running a mile will only burn 80 to 110 Calories. Since they are aware that it is necessary to burn approximately 3500 Calories to lose a pound of weight, they assume that it is impossible to lose weight in this manner. It is important to look at the long-term effect of exercise to understand how important exercise can be in weight control. Assume a student is encouraged to walk a mile each day and burns off 100 Calories per mile. Over a period of 35 days, if all other factors remain equal, a total of 3500 extra Calories will be metabolized. This will result in a net loss of 1 lb. of weight. If this regimen is maintained for a year, the amount of weight lost will be 10 lbs. This would be a significant weight loss, caused by an increase of daily activity. The point to remember is that the additive effect of exercise can be quite dramatic.

Another advantage to using aerobic activities for obese children is that it has an impact on caloric expenditure. Sharkey (1978) reported that approximately 30 minutes of vigorous and demanding activity will not only burn calories during exercise, but will double caloric expenditure for six hours following the exercise period.

Based on the discussion above, the program described here will be focused on increasing the obese child's activity level.

An important point to remember when dealing with obese children is that scale weight is usually not an effective evaluation tool. When working with preadolescent youngsters, many teachers have made the assumption that if scale weight can be maintained or lost, the program will be successful. This is an unreasonable goal. Over an 18 week period, youngsters in this age group consistently gain an average of 3 to 5 lbs. of weight and grow one inch or more in height. However, at the same time, their skinfold measurements decrease an average of 1 to 2 millimeters. What this dem-

onstrates is that it is impossible for growing youngsters to maintain or lose weight. They can, however, gain weight while losing body fat. This reinforces the importance of skinfold measurements as described in the *AAHPERD Health Related Physical Fitness Test Manual* (1980).

Teachers must understand that the obese youngster finds it difficult to participate in aerobic activity. It is not uncommon for a youngster with this problem to dislike physical activity. If you choose to help obese children it is important to be gentle, concentrate on small increments of success, and to avoid failure. Nothing is more devastating to children who want to lose weight than to find out after 18 weeks of activity they have been unsuccessful, even with the teacher's help. Teachers working with obese youngsters should hold no false pretenses and should focus on personal effort and dedication. It should also be noted that working with the excessively obese youngster is probably in poor judgment. Seldom have physical education teachers been successful in helping the highly obese; this child is in need of medical help and should be referred to the school nurse.

Implementing a Program for Obese Youngsters

There are three key individuals responsible for developing a successful fitness program for obese children: the child, the teacher, and the parent(s). If one of the three is not interested in dealing with the problem, then the odds are high that the program will be unsuccessful. The child must realize that there is a problem, and want to solve it; the teacher must have a genuine concern for the child and want to help; and the parents must be willing to help at home. It is important to have a conference with both parents and child to assure that they want to work cooperatively. An awareness of what to expect from parents is important since statistics show that obese children generally come from homes where parents are obese. When both parents are obese, 80% of the children will be obese. If both parents are normal weight, only 8% of the youngsters will be obese. This dictates a sensitive approach to the problem since many of the parents may also be obese.

Selection of Program Participants

In selecting participants, every effort should be made to include students who have a high probability for success. The *AAHPERD Health Related Physical Fitness Test* can be used to screen students for a minimal level of physical fitness. For example, many programs have had success accepting students into the program if they fall between the 15th and 40th percentile on the skinfold norms. In most cases, students outside this range are either not obese, or are too obese for treatment in a physical education setting. The better the youngster scores on the mile run-walk test, the stronger is the possibility that they will be willing to particpate in aerobic activities. It should be added that emphasis should be placed on the walking aspects of this test since many of these youngsters will not be in adequate physical condition to run a mile.

Other data can be gathered to facilitate selection. Evaluative data is most helpful for taking an objective look at the youngster. It avoids the emotional approach to selection of students which can result in false hope. The data is also helpful at a later stage in demonstrating the progress (or lack thereof) that the student is making. Further evaluation can be done of height and weight; attitude inventories such as the *Children's Attitude Toward Physical Activity* (1974) can be taken; and self-concept scales can be used. It is encouraging to both teachers and parents to see that the program has resulted in a more positive feeling toward physical activity. One final point in selecting students for inclusion: some schools have had excellent success in establishing a fitness council. This group can include a classroom teacher, a principal, school nurse, parent, and counselor. The bottom line is to try to select students who can be successfully treated in the program.

Parental Involvement

Few programs will be successful if parents do not stand fully behind the program. The following points will help generate needed support:

1. A meeting should be held with parents of *potential* candidates. The purpose of the meeting is to see if they are genuinely interested in helping and supporting their youngster's ef-

forts. Topics which should be covered in the meeting are objectives of the program, data which demonstrates and explains why their youngster has been classified as obese, and the responsibilities of both student and parent.

2. Parents should be given a handout which explains the program and related responsibilities of the parent and child. This allows both parties to discuss the program at home without outside pressure.

3. Parents should understand that the program will not continue if either the parent or child fails to uphold designated responsibilities.

4. A permission slip should be given at the meeting which both students and parent sign after the in-home discussion and return indicating whether they want to participate.

Implementing the Program

One of the first decisions to make is whether to group youngsters homogeneously or heterogeneously. An advantage in grouping obese youngsters in one class for exercise and activity is ease of administration for the teacher (but not for the school as a whole). To some degree, they have something in common and grouping may ease the embarassment of the situation. On the other hand, the problems of obesity are varied and demand a great deal of individual attention. Grouping obese youngsters also creates an environment which is unreal and may cause both participants and teachers to lower their expectations due to the fact that there are no "normal" performers in the class. An approach that has been successful is to offer a one on one meeting with the teacher once a week. In the meeting, the teacher can discuss the student's progress, listen to problems the child is having, and offer direction and activity assignment for the student. The emphasis of this approach is to increase the amount of activity in which the child participates *independently, outside of class*. This approach meets the personal needs of each student and allows activity to be adapted to those needs. It is also more in line with actual lifestyle—students are responsible for performing the assigned activity without someone looking over their shoulder or pushing them. Many approaches to obesity have been successful only as long as someone was monitoring the program. However, when students leave the program, the excessive weight problem recurs.

Assigning Activity

The following points can be used as guidelines in assigning increased aerobic activity for youngsters. The activity should be enjoyable and result in an increase in the amount of aerobic endurance activity accomplished by the child. The following guidelines can be used in developing activity programs.

1. Activity assigned to the youngster should be aerobic in nature. The assignment should be *in addition to* the activity the student normally participates in during a typical school day.

2. Prescription should be based on the child's tolerance for exercise. This means that it is important to understand the child's capabilities. If the exercise assignment is too easy, little will be gained. On the other hand, if the assignment is too difficult, the child may be turned off and discouraged by the program.

3. Record the activity assignment in order to assure that gradual overload and progression is occurring. The records can also be excellent motivators; the participant can demonstrate how much progress has been made over the duration of the program.

4. Offer two or three aerobic activities the youngster enjoys. It is important to avoid boredom in the early stages of the program. Choices will also start to teach the child that there are different types of activity which can facilitate fitness development.

5. Assignments should be made in minutes per day. If the youngster is in poor physical condition, the assignments may have to be short bouts of activity throughout the day. As fitness improves, the amount of continuous activity done at one time can be increased. A recommended starting point is 10 minutes of exercise daily. Increase the dosage by 2 minutes weekly until a maximum of 30 to 40 minutes is reached.

6. The following are examples of activities which may be enjoyable for the obese child: walking, skateboarding, rollerskating, iceskating, bicycling, motorcross biking, hiking, unorganized "sandlot" games, orienteering, jogging, swimming, and rope jumping.

Any fitness program for the obese child has to be designed to accept the inherent limitations of the participants. Not only do obese youngsters find it more difficult to exercise, they also have little or no predisposition to

exercise. Since there are so many obese youngsters in today's society, it becomes extremely important to deal with this malady.

Fitness for Handicapped Children

Fitness opportunities for handicapped children must be offered in the school setting. The situation discussed in this section will be based on the practice of mainstreaming handicapped youngsters into the physical education class setting. It is beyond the scope of this text to offer a total fitness program developed specifically for handicapped children. Mainstreaming involves compromise if the needs of all participants are going to be met. However, the personal rewards and social development the handicapped youngster can experience certainly offset the inconvenience felt by teachers involved in mainstreaming practices.

Mainstreaming is most often used in the physical education setting. There are many approaches used in the practice, with the most commonly used as follows:

1. *Full mainstreaming:* Handicapped youngsters participate as full-time members of a physical education class. Within their limitations, they participate in physical education activities with nonhandicapped peers.
2. *Partial mainstreaming:* Students take part in selected physical education activities but do not meet on a full time basis due to their inability to find success in some activities. Developmental needs which cannot be met in the regular physical education class are met in special classes.
3. *Reverse mainstreaming:* Nonhandicapped children are brought into a special physical education class to promote intergroup peer relationships.

Although mainstreaming is most often used in the physical education setting, there are few valid guidelines available for the physical education specialist. The advantages of mainstreaming are no longer questioned. What *is* questioned is the best way to mainstream effectively. Many teachers have little or no training to deal with the handicapped youngster. The burden of responsibility falls on the shoulders of the teacher, to retrain both in terms of attitude and expertise. The handicapped youngster must be seen as a member of the class with the same privileges and needs as others.

A responsible decision needs to be made as to whether the handicapped child is capable of being mainstreamed. The child must be able to accomplish the large majority, if not all, the activities being taught in the class. It is neither fair to teacher nor the student to place a child into a setting where failure is predetermined. The program should focus on what the youngster can do rather than what can't be done. Any approach which treats the handicapped child as a cripple dehumanizes the youngster and results in an outcome that is worse than no program at all.

All students in the class should find the opportunity to be challenged and make progress. The educational needs of the handicapped must be met without jeopardizing the progress of other students. This does not rule out some modifications so the handicapped can be included—some adapted equipment might be necessary, for example. A wonderful aspect of fitness activity is that it demands little special equipment and uses low level motor patterns which the majority of students are capable of performing.

Integrating Special Students into Physical Education Classes

In the long run, it may be determined that the most important factor in teaching the handicapped child will be the attitude and concern directed toward the child. Certainly, the teacher should be concerned with enhancing physical fitness levels in all youngsters. If the atmosphere is not one of care and concern, it is possible that any increase in the degree of physical fitness will be outweighed by the trauma of an emotionally scarring experience. The following are guidelines which may facilitate successful integration of the child into the physical education setting:

1. Involve other professionals and parents to help the child find success. If it is important for the child to be mainstreamed into physical education, an aide or teacher should do everything possible to help make the transition a smooth one. If the teacher and student get off on the wrong foot, the experience may be very negative. Having support personnel available to help mainstream children learn the experiences and routines will facilitate the progress for all concerned.

2. Instructional focus should be on ability and strengths of the child. Strong attempts should be made to avoid situations which give rise to embarassment, such as performing in front of others, running laps while early finishers observe, and holding contests to see who is strongest, fastest, etc.

3. Peer acceptance of the mainstreamed child is enhanced when students observe the instructor responding to the child in a warm, caring manner. In most cases, the instructor's *behavior* will speak louder than his or her *words*.

4. Focus on physical activities the youngster can perform. Ignore situations where the child's handicap prevents successful performance. Generate excitement and enthusiasm when performance improves so other students are aware of the progress being made.

5. Effective record keeping is important so that parents and classroom instructors are aware of progress. Progress is motivating to all parties concerned and should relate improvement in the various areas of fitness.

6. Teachers sometimes feel that they shouldn't have to modify instruction and program to meet the needs of the special child. This sort of stubbornness will only serve to erode the child's confidence. All effective teachers constantly modify their approaches and techniques for all children regardless of handicap.

7. If a special education consultant is available, he or she should be used for support and evaluative services. By observing and evaluating the fitness presentation, the consultant may be able to offer insight and advice to make the instructional approach more effective.

These guidelines speak primarily to sound instructional practices based on love, concern, and enthusiasm. Mainstreaming creates an environment for the teacher that is varied and challenging. There is little question that it takes more work to assure success for all children. By failing to mainstream, however, the chance for offering the special child a lifetime of fitness may be lost.

Modifying Participation

As mentioned above, activities need to be modified in order to help the special child find success. Judgments have to be made based on the child's fitness level and type of impairment. Whenever possible, the situation should be modified so the youngster feels as though he or she has made a contribution to the entire class. All children have a right to feel important and needed. The following are suggestions for modifying various situations in order to enhance effective participation.

1. A first step is to observe the youngster for the first few sessions. This will offer insight into how much the child is capable of performing. Try to develop a role in fitness activities which is based on the child's competency so the experience is as natural as possible.

2. Adapt rules to assure that the child has a chance for success. Success shouldn't be guaranteed, however, or the activity will not be challenging. As an example, if running is being done, the handicapped child may be given a different challenge or goal than regular students. Ask the child for feedback about what is challenging to them. Many will want the task modified only slightly—they want to be challenged, not pampered.

3. Progression and overload are extremely important variables which should be monitored closely with handicapped children. It may be necessary to vary the intensity and time factors (see Chapter 2) in order to assure that the handicapped youngster is not overfatigued.

4. Situations which help regular and handicapped students understand each other can be arranged. For example, a handicapped youngster in braces might exercise with a regular student performing on borrowed crutches. Regular students could be placed in wheelchairs to understand the tremendous effort needed to exercise in this setting. This technique can often generate empathy and understanding for all students involved.

5. If squads are to be used, make sure they are organized in a manner which is not degrading, i.e., letting captains choose their friends until the handicapped or obese youngsters are the only ones left.

6. If fitness games are being played, change the rules so no players are eliminated. Often, the players eliminated earliest are those who need the activity the most. If points are scored when a player is tagged etc., the point system can be varied so the handicapped youngster with limited mobility is penalized to a lesser degree.

7. Squads should be equalized and rotated

on a regular basis so that special chidlren are equally distributed. Changing the membership of squads on a regular basis will allow youngsters to understand and communicate with children possessing varying handicaps.

8. Modify equipment and facilities as needed. Jogging tracks of varying distances and pull-up bars at different heights are examples of modifications based on the needs of participants.

9. Learn to teach using both verbal and visual hand signals. This will facilitate learning for students with hearing problems.

10. It may be necessary to have an aide or another student (cross-age tutoring by older students) teach the special child prior to the mainstreaming. This is sometimes necessary since handicapped youngsters may be unwilling to try due to embarrassment and fear of failure. Confidence can be developed in an individual or small group setting.

The focus of all the techniques mentioned should be to smoothly integrate the youngster into the class setting. The more often the special child can be made to feel like a "real" and important member of the class, the more chance there is for progress. The ability of the special child should not be underestimated. Expect them to perform and improve their personal fitness levels.

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CHAPTER FOUR

TEACHING FITNESS FOR A LIFETIME

Developing Positive Attitudes Toward Fitness
Decision Making for Fitness
Leading Discussions on Wellness
Wellness Topics for Discussion

Improving the physical fitness of children is an essential goal for elementary physical education. Successful attainment of acceptable levels of physical fitness is almost entirely dependent on the physical education program. Teacher behavior, types of activity, time allotment, length of class period, and other factors influence the degree to which the physical fitness objective can be met. It is well known that the fitness of children can be developed and maintained through carefully monitored assessment and evaluation techniques, followed by a balanced systematic approach to the presentation of fitness routines. But, if physical fitness is to be a lifetime pursuit, youngsters must have an understanding of the "how and why" of fitness, and must develop a positive attitude toward vigorous physical activity and exercise. The realization of immediate fitness expectations through regimented calisthenics is, at best, a short term solution to a long term problem.

Results of recent research are dispelling the myth that children freely participate in physical activity with sufficient FIT to incur a training effect. A child's inclination toward only moderate physical activity during free play time, with less than acceptable degrees of FIT, has been repeatedly verified through observational studies designed to establish movement frequency during periods of recess and recreation (Cumming, 1975; Hovell, 1978). The health related physical fitness of children has been found to deteriorate during the months of summer vacation (Hastad & Pangrazi, 1983). Evidence is mounting which suggests that children do not appear to have a "biological handicap" in performing prolonged sessions of exercise, but rather, seldom engage in extended physical activity because they perceive it to be monotonous (Macek & Vavra, 1974).

In an attempt to offset children's apparent disinterest in vigorous physical activity during free time and to encourage participation in fitness related activities, it becomes imperative to implement strategies designed to develop cognition about, and positive attitudes toward, physical fitness. If we accept the premise that understanding and appreciating physical activity and the self are prerequisites to voluntary participation in fitness related activities, then we must also be sure that children enjoy physical activity and acquire the necessary cognitive skills to make sensible and knowledgeable decisions about personal physical activity habits.

Developing Positive Attitudes Toward Fitness

Exercise can contribute to improved physical well-being and enhanced quality of life for individuals of all ages. Developing a positive attitude toward physical activity should begin during the formative years. Initially, emphasis should be placed on enjoying the activity and better understanding the body's capacity for physical performance. Since children can exercise regularly, are physiologically well-equipped for endurance activity, and perform well in aerobic exercise, fitness routines which promote enjoyment of vigorous exercise should be presented. The following instructional strategies can be used to make exercise more enjoyable for the child.

1. Instructors should individualize exercise to accommodate the various stages of physical growth and development demonstrated by elementary school children. Students who are expected to participate in fitness activities but, due to delayed physical maturity, find themselves unable to perform some or all of the exercises, are not likely to develop a positive attitude toward physical activity.

2. Children should be exposed to a wide variety of physical fitness routines and exercises. Presenting diverse fitness opportunities not only decreases the monotony of doing the same routines week after week, but also increases the likelihood that the child will experience activities which are personally enjoyable. Avoiding potential boredom by systematically changing the type and approach to fitness activities is a significant step in helping the child perceive fitness as something positive.

3. Youngsters should understand the value of being physically fit, how to apply the principles of exercise, and how fitness can become part of one's lifestyle. Planned mini-lessons which present the various concepts of fitness, or an informal meeting at the end of the lesson to discuss key fitness points learned during class can assist in promoting an enthusiasm for fitness, and an understanding of why it is important.

4. Children should be assured of success in fitness activities. Everyone enjoys success,

especially children. Youngsters become motivated to perform when they sense that success is possible. Planning fitness activities so that all children can succeed is not a simple task. Teachers must have a working knowledge of the physical performance capabilities and limitations of each child, and must set goals accordingly. Expectations must be realistic and attainable. Realization of fitness goals can only serve to foster a positive outlook toward physical activity.

5. Teacher feedback in the form of verbal, nonverbal, or written communication can contribute to the way the child views fitness activities. Immediate, accurate, and specific feedback regarding performance encourages continued participation. Provided in a positive manner, this feedback can stimulate a child to extend participation in exercise beyond the confines of the gymnasium.

6. Role modeling is another device which can influence a child's attitude toward physical fitness. We must remember that a teacher, through appearance, attitude, and actions, exemplifies an "end product." Teachers who continually express a physical vitality, take pride in being active, participate in fitness activities with the children, and are physically fit are clearly able to positively influence a child's attitude about an active lifestyle.

Decision Making for Fitness

While disappointing, the progressive decline in children's physical fitness, coupled with a renewed national emphasis on health, physical well-being, and an active lifestyle, can be seen as a great opportunity for physical education. With the public eye focused directly on student outcomes, physical education is in a unique position to establish itself as an indispensable component of the child's educational experience.

The first responsibility of the school is to provide opportunities for the youngsters to achieve the goal of developing and maintaining a level of physical fitness commensurate with their needs. This responsibility can be fulfilled through a systematic, planned approach to physical fitness. The school's responsibility, however, does not end with improved scores. Children must be provided with the information necessary to translate what the teacher tells them to do into doing things on their own. Youngsters must begin to establish their own exercise patterns and learn how to self-test and interpret the results. Most importantly, they must learn how to plan and be responsible for a personal exercise program. Steps must be taken to assure that children are given opportunities to acquire the skills necessary for making thoughtful decisions about their fitness program. Suggested tactics to facilitate acquisition of decision-making skills include:

1. *Involving the child in the development of purposeful and realistic goals.* Fitness goals which are viewed as worthwhile and attainable and which have been determined, at least in part, by the child are more likely to prompt child-initiated activity than goals established solely by the teacher.

2. *Providing personalized learning opportunities.* Intermediate grade students can benefit from learning activities which include self-testing, assisting in administration and scoring of fitness tests, and interpretation of health fitness items.

3. *Relying on self-discovery techniques.* Through self-discovery activities and various teaching styles, the teacher can create learning situations which place the child in a decision-making position.

4. *Encouraging participation in out-of-school fitness activities.* Rewarding the exercise patterns of youngsters during nonschool time can assist in motivating children into vigorous physical activity.

5. *Allowing students to select the fitness activities.* Providing alternative exercises encourages the child to make personal choices.

Leading Discussions on Wellness

Physical fitness refers to the general overall physical health and well-being of an individual. Wellness, on the other hand, is a term which means more than "feeling good." It refers to attainment of a special type of lifestyle and focuses on living life to the fullest.

The popularity of wellness programs is apparent. Major medical centers, colleges and universities, business corporations, and even high schools are implementing programs which emphasize personal wellness planning. It is ironic that planned efforts in wellness education have only recently filtered down into the elementary schools.

The primary goal of a wellness program in the elementary school should be to establish a fundamental basis for effective living. Wellness instruction in the elementary school should be a shared responsibility. Some aspects of wellness, such as development of a personalized level of physical fitness, are the responsibility of the physical educator. Many other topics, such as substance abuse, stress, obesity, and nutrition, can be included in science and health units taught by the classroom teacher with added support from the physical education teacher.

Movement is the basis for physical education. We do not recommend substituting a knowledge based discussion for physical activity. However, activity without a rudimentary knowledge of "how and why" may limit the desired long term fitness benefits. If wellness cannot be incorporated into the schoolwide curricula, then it becomes the responsibility of the physical educator to devise a means for providing wellness instruction to the child. Effective alternative approaches to teaching wellness concepts in physical education include:

1. *The mini-lesson.* This is a brief (no more than 5 minutes) instructional episode focusing on a particular aspect of wellness.
2. *Block scheduling.* Several nonconsecutive weeks during the school year are dedicated to the teaching of wellness concepts. While this means the cancelling of regular physical education classes, the resulting concentrated instruction in a uninterrupted classroom setting is conducive to cognitive and affective learning.

Leading discussions on wellness topics require the teacher to effectively establish and maintain a climate conducive to open communication. Teaching behaviors necessary for successful discussions are:

- *structuring*—used to help the teacher create a situation which facilitates unrestricted communication
- *focus setting*—used to clearly identify the topic of discussion
- *clarifying*—used to illicit a better understanding of the student's comments
- *acknowledging*—used to communicate to the student that comments have been understood and useful to the discussion
- *teacher silence*—indicates to the students that it is their responsibility to carry on the discussion

Wellness Topics for Discussion

It is important to remember that the basis for physical education is movement. We must be careful not to devote excessive amounts of physical education time to discussion. Instead, wellness discussions should be judiciously planned to coincide with functional rest periods interspersed throughout the lesson, or reserved for the end of the class. To maintain the student's interest, topics should be timely, pertinent, and understandable. When presenting topics, it is important to highlight key components associated with the topic and to provide selected learning experiences which may assist the child in better understanding the concept. Suggested wellness topics are exercise, nutrition, obesity, stress, and substance abuse.

Exercise

Central to any physical fitness program is exercise. In elementary physical education, exercise can take many forms. Aerobic and anaerobic activities, calisthenics, sports activities, animal walks, dance, and other diverse forms of movement can constitute exercise. Exercise as defined in this book is used to describe sustained large muscle activity rather than highly specialized nonlocomotor movements. Exercise is a means to develop and maintain physical fitness. For children to attain optimal levels of fitness requires adherence to frequency, intensity, and time of activity (FIT). Chapters 2 and 5, respectively, provide a detailed explanation of the principles of exercise and exercise routines.

School programs which should emphasize exercise include: physical education, fitness testing, before- or afterschool sports, and scheduled physical activities for handicapped children. Youngsters can be motivated to participate in exercise through an appropriate award system, attractive bulletin boards, educational microcomputer software, special programs emphasizing physical fitness, school demonstrations, periodic fitness assessment, and controlled competition.

Key Concepts

1. Fitness can be acquired only through muscular effort.

2. Fitness is a lifelong pursuit with habits formed during the elementary school years.

3. Development and maintenance of fitness requires a regular program which adheres to the principles of FIT.

4. Increasing the workload is the only way to improve fitness.

5. Cardiorespiratory fitness is improved through exercise of long duration.

6. To be effective, exercises must be done properly.

7. Static (slow) stretching, rather than ballistic (fast) stretching, is the recommended procedure to improve flexibility.

8. Exercise is specific. To improve the fitness of a particular muscle (or group of muscles) requires exercising that muscle.

9. Especially during the elementary years, muscular strength is directly related to good posture.

Learning Experiences for Kindergarten-Third Grade

1. Have children list different types of exercise. Put a blue dot next to activities which improve cardiovascular fitness and reduce body fat; a green dot next to activities which improve flexibility; a yellow dot next to those activities which improve muscular strength and endurance. Determine which exercises improve all components of health related physical fitness.

2. Ask that students work with a partner and exercise before or after school. Discuss the value of exercising with a friend.

3. Introduce the skeletal and muscular systems of the body. Obtain bones, charts, x-rays, and other audio visual resources to show the various bones and muscules of the body. Discuss how exercise affects the growth and development of the body.

4. Use word jumbles, dot-to-dots, word searches, crossword puzzles, and other instructional games to teach vocabulary associated with exercise.

5. Take the children on a field trip to a local health and fitness club. Arrange for a fitness instructor to lead the children through a typical workout. Introduce them to exercise bicycles, treadmills, and other equipment usually available in fitness facilities.

Learning Experiences for Fourth-Sixth Grade

1. Ask students to list activities they enjoy. Identify the components of fitness which are developed through participation in these favorite activities. Determine which activities enhance health fitness and which improve components of skill related fitness.

2. Teach children how to calculate their target heart rate. Identify exercises which allow them to attain the desired heart rate.

3. Have youngsters plan a personal exercise program. Ask them to keep a diary of their exercise routine. After several weeks, let them share their experiences with classmates.

4. Use educational microcomputer software to teach the principles and concepts of exercise. Two good sources of information about available software are: *CompTech Systems Design,* PO Box 516, Hastings, MN, 55033; *Edu-Tron,* 3112 Waits Avenue, Fort Worth,TX, 76109.

5. Differentiate between aerobic and anaerobic exercise. Plan activities which help the child feel the difference between the two types of exercise.

Nutrition

The nutritional needs of children are much the same as those of adults. Youngsters require a high proportion of foods containing proper nourishment and energy for growth, maintenance, and repair of tissues, and for physical activity. Different amounts of these nutrients are essential to life. Proper nutrition is necessary if one is to obtain an optimum level of physical performance from one's body.

The elements in foods that are required for maintenance and growth of the body are called nutrients. Essential nutrients which provide energy (as measured in calories) are carbohydrates, proteins, and fats. Also essential, but needed in smaller amounts, are vitamins and minerals. These fundamental nutrients are found in the four basic food groups: (1) fruits and vegetables, (2) milk and milk products, (3) meat, fish, poultry with nuts and legumes as supplements, and (4) breads and cereals.

Children should learn about the elements of a balanced diet. While it is important to eat foods from the various food groups, moderation in the consumption of cholesterol and fat is advised. Excessive body fat makes the heart work much harder than normal and increases the chances of having high blood pressure. The ingestion of too much fat has been found to increase the amount of cholesterol and tri-

Fig. 4.1. Formula and an example for calculating target heart rates. (Example is for a 10 year old child with a resting heart rate of 75 BPM.)

Step 1:	*Formula for Calculating Maximal Heart Rate*	*Example:*
	220 − Age (in years) = Maximal Heart Rate	220 − 10 210 BPM
Step 2:	*Formula for Calculating Working Heart Rate*	*Example:*
	Maximal Heart Rate − Resting Heart Rate = Working Heart Rate	210 − 75 135
Step 3:	*Formula for Calculating Threshold of Training Heart Rate*	*Example:*
	Working Heart Rate * .60	135 * .60 = 81
	+ Resting Heart Rate	+ 75
	= Threshold of Training Heart Rate	= 156
Step 4:	*Formula for Calculating the Upper Limit of the Target Heart Rate Zone*	*Example:*
	Working Heart Rate * .90	135 * .90 = 121
	+ Resting Heart Rate	+ 75
	= Upper Limit for Target Heart Rate Zone	= 196

The target zone for this 10 year old child is 156-196.

Fig. 4.2. Recommended daily dietary allowances for children ages 6-12.

Age	Calories	Protein (gm)	Calcium (gm)	Iron (mg)	Vitamin A (I.U.)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Vitamin C (mg)
6-8	2000	35	0.9	10	3500	1.0	1.1	13	40
8-10	2100	40	1.0	10	3500	1.1	1.2	15	40
10-12 (boys)	2500	45	1.2	10	4500	1.3	1.3	17	40
10-12 (girls)	2250	50	1.2	18	4500	1.1	1.3	15	40

Source: U.S. Department of Agriculture. "Nutritive Value of Foods." *Home and Garden*, Bulletin 72, 1976, p. 40.

glyceride levels in the blood. Results of recent scientific investigations have demonstrated a direct relationship between high cholesterol and triglyceride levels and the presence of coronary heart disease. Dietary sources high in cholesterol include: cheese, eggs, butter, shrimp, cake, pies, chocolate candy, ice cream, most beef and pork, and milk.

Since a large majority of the obesity problem in children is linked to overeating and inactivity, it is important to teach children about the caloric content of food (in addition to the nutritional values). To offset excessive caloric consumption, youngsters need to learn to monitor the amount of calories ingested and the amount of calories burned by different types of physical activity.

Key Concepts

1. The American public is food conscious, but not very nutrition-wise.
2. Excessive body fat, due in part to poor dietary habits, has become increasingly prevalent in children.
3. There are numerous myths and misinformation about what foods do.
4. To ensure that the body is receiving essential nutrients, the diet should be balanced and contain foods from each of the four food groups.
5. Fad diets are a poor means to weight control and may contribute to health problems.
6. Necessary caloric consumption is dependent on age, sex, size, muscle mass, glan-

Fig. 4.3. Foods recommended for daily diets of children ages 6-12.

Food Group	Food Source	Quantity
Meats	Meat, poultry, fish	2-4 oz.
	Second protein dish: small serving meat, legumes, or nuts	4-6 tbsp.
	Eggs	1 whole egg
Vegetables and fruits	Potatoes (or equivalent amount of rice, macaroni, spaghetti)	1 medium to large, or 4-5 tbsp.
	Other cooked vegetables (green leafy or deep yellow) frequently	4-5 tbsp. at one or more meals
	Raw vegetables (carrots, lettuce, celery, etc.)	¼ to ⅓ cup
	Vitamin C food (citrus fruits, tomatoes, etc.)	1 medium orange or equivalent
	Other fruits	½ c. or more at one or more meals
Bread and cereal	Cereal (whole-grain, restored, or enriched)	¾ c. or more
Milk	Milk (or equivalent)	1½ pt. (2-3 c.)
Miscellaneous	Butter or fortified margarine	1 tbsp. or more
	Sweets	½ c. simple dessert at 1 or 2 meals

Source: From Bogert, L. Jean, Briggs, George M., and Calloway, Doris H.: *Nutrition and Physical Fitness*, Ninth Edition, W. B. Saunders Company, Philadelphia, Pa.

Fig. 4.4. Minutes of activity needed to burn up food calories.

Calories	Food	Sedentary	Light	Moderate	Vigorous	Strenuous
630	Burger King Whopper	543	252	126	84	63
541	McDonald's Big Mac	466	216	108	72	54
258	Burger Chef Hamburger	222	103	52	34	26
440	Arthur Treacher's Fish Sandwich	379	176	88	59	44
402	McDonald's Filet-O-Fish	347	161	80	54	40
409	Long John Silver's Fish (2 pcs.)	353	164	82	55	41
830	Kentucky Fried Original Recipe Three Piece Dinner	716	332	166	111	83
950	Kentucky Fried Extra-Crispy Three Piece Dinner	819	380	190	127	95
340	Pizza Hut Thin 'n Crispy Cheese Pizza (half 13" pie)	293	136	68	45	34
450	Pizza Hut Thick 'n Chewy Pepperoni Pizza (half 10" pie)	388	180	90	60	45
352	McDonald's Egg McMuffin	303	141	70	47	35
186	Taco Bell Taco	160	74	37	25	19
270	Dairy Queen Brazier Hot Dog	233	108	54	36	27
210	Burger King French Fries	181	84	42	28	21
300	Dairy Queen Onion Rings	259	120	60	40	30
340	Burger King Vanilla Shake	293	136	68	45	34
364	McDonald's Chocolate Shake	314	146	72	49	36
300	McDonald's Apple Pie	259	120	60	40	30
15	2—8-inch Celery Stalks	13	6	3	2	1
55	2 Medium Graham Crackers	47	22	11	7	6
105	2 teaspoons Peanuts	91	42	21	14	11
145	1 cup Plain Low Fat Yogurt	125	58	29	19	15
225	1 cup Fruit Flavored Yogurt	194	90	45	30	23
430	12 ounce Chocolate Milkshake	371	172	86	57	43

Source: From Kuntzleman, C. T. (1980). *The Beat Goes On.* Arbor Press: Arbor, Michigan.

dular function, emotional state, climate, and amount of physical activity.

7. Physically active children do not need more protein than sedentary children.

8. Weight maintenance is best achieved through a combination of caloric reduction and energy expenditure.

9. Junk foods are usually high in calories and low in nutritional value.

10. Excessive consumption of fat increases the chance of heart disease.

11. Physical activities vary in energy expenditure. Individual needs must be considered in the selection of exercise activities.

Learning Experiences for Kindergarten-Third Grade

1. Have children measure their height and weight. Continue this on a monthly basis for the entire school year.

2. Cut out pictures of food from magazines. Select pictures which show one kind of food. See if the children can sort the pictures into the four basic food groups. Then make a poster of the pictures.

3. Ask children to plan three meals for their family. Be sure they include essential foods from each of the four groups. Do not forget to include drinks.

4. Introduce children to cookbooks. Let them become familiar with the terms food, Calorie, carbohydrate, mineral, protein, and other nutritional terms.

5. Make a breakfast suggestion box. Ask children to bring breakfast recipes from home. Use this to develop a breakfast menu.

Learning Experiences for Fourth-Sixth Grade

1. Familiarize students with microcomputer software which is designed to teach the concepts and principles of proper nutrition.

2. Have children plan and prepare meals. Be sure that all food groups are represented in the meals. Encourage children to ask their Mom or Dad for an opportunity to cook at home.

3. Have children talk with adults about the ways foods and access to foods have changed since he or she was growing up. Discuss the differences between fast foods and traditional meals.

4. Conduct simulated grocery shopping experiences. Give children play money to buy groceries for one week. Analyze the purchases in terms of nutritional requirements, food group representation, and cost effectiveness.

Obesity

Physical attractiveness is probably the primary reason individuals are concerned about weight control. Desirable weight is usually derived from charts which base estimations on height, age, and sex. While proper weight charts are good guidelines, it is becoming more apparent that height-weight tables are not as accurate an indication of health as body composition.

While tables which convert millimeters of skinfold thickness to percent body fat have been readily available for adults, only recently has it been possible to accurately translate sum of skinfold to percentage of body fat in children (See Figure 2.5 on page 00). The ability to accurately predict body composition of children makes the skinfold test more meaningful and represents a milestone in fitness evaluation.

Key Concepts

1. Overfat is different from overweight and is more important in determining health.

2. Obesity is a national health concern affecting all segments of our society.

3. Obesity increases the risk of heart disease and related health problems.

4. Weight is not necessarily an accurate measure of obesity. Skinfold calipers which measure thickness of body fat should be used to determine percentage of body fat.

5. Responding to overfatness by excessive dieting can be dangerous and lead to serious health problems.

6. Obese children often experience physical activities in ways different from children of normal weight.

7. Obesity impedes skill acquisition.

8. Exercise and vigorous physical activity is an effective means to control body fat.

9. Sustained exercise for long periods of time is perhaps the best way to reduce body fat.

10. Fat children usually become fat adults.

Learning Experiences for Kindergarten-Third Grade

1. Show the children a jar of chicken fat. Inform them that this is how fat looks in their body.
2. Devise bulletin boards which show pictures of obese adults. Discuss the importance of developing a lean physique early in life.
3. Have children make their own skinfold caliper (see Figure 2.16 on page 00). Teach them how to measure skinfold thickness.
4. There are many educational materials which teach concepts of obesity. Workbooks, coloring books, and other media can be used to teach children about obesity. The Fitness Finders *Feelin' Good Program* (133 Teft Road, PO Box 507, Spring Arbor, Michigan, 49283) is a popular clearinghouse for fitness materials.
5. Use the microcomputer to develop word searches, crossword puzzles, dot-to-dots, and other games which have obesity as the theme.

Learning Experiences for Fourth-Sixth Grade

1. Explain the difference between body weight and percentage of body fat. Emphasize the importance of using percentage of body fat as an indicator of health.
2. From the sum of skinfold (triceps and subscapular) determine percentage of body fat. Have children convert percentage of fat into pounds of fat (actually body weight × percentage of fat). To show how this unnecessary fat burdens the body and inhibits movement, have youngsters carry a book bag or back pack of equal weight for an entire school day.
3. Introduce children to caloric expenditure tables. Ask them to see how many calories can be burned by participating in their favorite physical activity.
4. Analyze the activity levels of other students in and out of class. Estimate the caloric expenditure of those observed.
5. Ask children to keep a record of their physical activity and caloric consumption for a week. At the end of the week, have them determine the difference between energy expended and calories consumed.
6. Discuss the ways society rewards physically fit individuals, and contrast this with the ways in which obese children are sometimes treated by teachers and classmates.

The term *stress* is used frequently to describe a person's reaction to the demands of modern society. Stress can be a pleasant or unpleasant motivating force that creates feelings of tension which can cause physiological or psychological changes in the human body. Physical responses to stress are increased heart rate, increased blood pressure, increased respiration rate, increased muscle tension and decreased digestive functions. In children, minor ailments such as headaches, stomach aches, back aches, loss of appetite, and iritability may also appear. Psychologically, stress can take the form of excitement, fear, or anger. The inability to relieve stress through productive means during childhood may lead to substance abuse in adulthood. Sources of stress for children include unrealistically high expectations imposed by parents, the educational environment, frustration due to the thwarting of desires, perceived personal inadequacies, self-imposed pressures to succeed, or conflicts arising from having to choose between alternatives. Realistic, challenging, and attainable goals tend to eliminate many frustrating and potentially stressful situations.

Children need to understand that stress induced changes in bodily functions can either inhibit or enhance physical performance. Teaching children how to recognize stressful symptoms and manage stress are essential elements to aid youngsters in achieving a productive and healthy outlook on life. Developing effective methods to cope with stress can be considered preventive medicine. One effective approach to handling stress is the four phase process:

1. *Evaluate the Situation.* An accurate appraisal of the situation is conducted. Past experience and current perceptions helps in formulating a true picture. Distorting the facts may decrease a person's chances of coping with the stressful situation.
2. *Determine Alternatives.* Rational decisions grow out of constructive thought. Therefore, alternative actions must be formulated from a logical, conscious process. The ultimate course of action depends on the probabilities of success, the degree of satisfaction one will accept, and the price one is willing to pay.
3. *Action Response.* Acting on a decision requires complete commitment on the part of the individual. The timing of an action-related decision and the context in which the decision is made are also important considerations associated with stress reduction. Youngsters

should only act when confidence is high and all availble alternatives have been evaluated. Delaying action may be just as stress producing as acting too soon.

4. *Utilizing Feedback.* If an action receives positive feedback, the outcome is reinforced and stress is reduced. If the action yields negative feedback, the action is likely to increase stress and should be questioned. In either case, using feedback to assess choices is helpful in preparing for future decisions.

Key Concepts

1. Stress is an unavoidable product of our fast-paced society and can be either productive or detrimental.
2. A certain amount of stress is necessary to stimulate performance.
3. Stress affects all people, regardless of age.
4. Many times, substance abuse or other unhealthy behaviors are the result of unsuccessful attempts to deal with stress.
5. Stress can cause alterations to bodily functions which may increase susceptibility to diseases.
6. Improper perceptions of our responsibilities may induce stress.
7. Stress interferes with our responses to normal everyday occurrences.
8. Changing goals, diversifying activities, and equating work and play can contribute to stress reduction.
9. Individuals react differently to stressful situations.
10. Vigorous physical activity is an excellent way to reduce stress and tension.
11. It is important to learn to live with personal expectations, not the expectations of others.

Learning Experiences for Kindergarten-Third Grade

1. Ask students to identify stressors. Discuss those which they have experienced.
2. Select a locomotor movement. Ask children to identify the muscles necessary to complete the movement and those which can be relaxed.
3. Discuss how different emotions (i.e. anger, happiness, sadness, etc.) affect the body.
4. Introduce relaxation techniques which may temporarily alleviate stress.
5. Ask children to perform a simple motor task. Then ask them to perform a skill which they are unable to perform. What feelings were experienced during the attempts at each?

Learning Experiences for Fourth-Sixth Grade

1. Identify situations in physical education which provoke stress. Include events such as unfair play, unsafe movement, discourteous behavior, and competitive situations.
2. Ask an athlete to speak to the class about controlling stress in highly competitive sporting contests.
3. Discuss alternatives to stress reduction. Include the use of drugs and other unhealthy practices in the conversation.
4. Try to determine the relationship between physical activity and stress reduction.
5. Discuss the importance of realistic goal setting in managing stress. Ask students to determine a practice sequence which will conclude with the performance of a previously unlearned complex skill. Have students identify the various types of stressors encountered during the learning of the task.

Substance Abuse

Drug abuse occurs when a substance is deliberately taken for reasons other than its intended purpose. Continued abuse usually results in some long-term physical, psychological, or social problem. By no means an accepted pattern of behavior among the majority of the American public, the abuse of tobacco, alcohol, and other recreational drugs is quite common among elementary school youngsters.

Facts about substance abuse should be presented to children without moralizing or preaching. Children need to know the impact of substance abuse on the healthy body. Wise and sensible decisions regarding the use of drugs usually result from understanding the facts about the short and long term effects of substance abuse. Substance abuse is so contrary to the concept of wellness that elementary physical educators must accept the challenge to increase awareness of the problem.

Key Concepts

1. Drugs are medical tools that may have many benefits when properly used.

2. There are a wide variety of drugs and other substances which, if misused, may be harmful.
3. Behavior patterns are established during the formative years and usually influence a person's lifestyle.
4. There are laws which control the production, distribution and use of drugs.
5. American society is responsible for the control of drug abuse.
6. The earlier one begins to abuse drugs, the greater the risk to functional health.
7. Individuals choose to abuse drugs for reasons of curiosity, status, and peer pressure.
8. Practicing a healthful lifestyle that is different from one's peers requires courage. Feeling good about oneself is more important than being accepted by peers.
9. Exercise and a physically active lifestyle are more productive ways to cope with problems than drugs.
10. Smoking constricts the blood vessels and causes the pulse rate to increase by 10 to 20 beats per minute.

Learning Experiences for Kindergarten-Third Grade

1. Invite a school nurse to talk about the hazards of drugs.
2. Discuss the type of information a doctor needs to prescribe drugs.
3. Ask the students to draw pictures of proper places to store medication.
4. Talk about the effects of smoking and alcohol consumption on a healthy body.
5. Identify the many forms of physical and psychological harm which result from drug abuse.
6. Discuss some of the social problems created by alcohol abuse.
7. Develop visuals (bulletin boards, mobiles, puzzles, etc.) which characterize healthy and unhealthy lifestyles.

Learning Experiences for Fourth-Sixth Grade

1. Invite a former smoker or alcoholic to speak to the class about their personal experiences with drugs.
2. Discuss the reasons why it is important to be your own person and to make wise and meaningful decisions.
3. Use role playing to place the children in decision-making situations.
4. Children are influenced by television ads depicting professional athletes using alcohol. Discuss the reasons why these elite athletes are not able to perform at high levels while using alcohol.
5. A homework assignment could consist of writing a report on the various diseases linked to abuse of tobacco and/or alcohol.
6. Conduct value clarification sessions to discuss how individuals can learn to make decisions about themselves without being pressured by peers.
7. Invite a doctor to speak about the physiological effects of substance abuse on performance.
8. There are many media packages and visual aids depicting the results of substance abuse which could be made available to students.
9. Discuss the value of a physically active lifestyle in reducing tension.
10. Discuss the economic impact that drug use has on American society. Look at work days lost, legal costs, property losses, accidents, rehabilitation expenses, and other cost factors.

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CHAPTER FIVE

FITNESS ACTIVITIES AND ROUTINES

Implementing Physical Fitness Activities
Effective Class Management
Fitness and the Physical Education Lesson
The Fitness Module
Physical Fitness Activities

This chapter has been written to provide the practitioner with information, activities, and tips to help implement a balanced approach to physical fitness in the daily lesson. The following sections discuss plans for a year long fitness program, exercises for total body development, exercise precautions, suggested fitness routines, and fitness adaptations for sports skills and games.

Implementing Physical Fitness Activities

(The following points are described with brevity since they have been covered in greater detail in previous chapters.) When developing fitness workouts for youngsters, remember that FIT is an acronym which is useful for remembering the rules for fitness prescription. (F)requency is the number of times per week fitness activities should be performed; three times per week is the minimum. (I)ntensity of cardiovascular exercise can be monitored by teaching children to check their heart rate. The training rate is reached when the heart rate is elevated into the training zone and maintained for a minimum of 10 minutes. (T)ime is the length of each exercise bout. A typical physical education period is 30 minutes in length. At least 10 minutes of the period should be devoted to activity which elevates the heart rate into the training zone as described above.

Progression must be followed when teaching fitness activities to children. The typical stereotype for physical fitness instruction has been the "daily dozen and run a mile" approach. This defeats everything we now know about individualized instruction. There is tremendous variation among children in terms of physical capacity (see chapter 1) which necessitates teaching to these differences. One of the most effective ways of turning children off to exercise is to ask them to do more than they are capable of doing. Keep initial demands low and gradually increase the workload. Organize activities so children do not have to start and finish activities at the same time. Begin the year with demands that are low enough to assure all children success. The battle may be won, but the war lost if children cultivate a negative attitude toward activity due to excessive workloads placed on them by an overenthusiastic instructor.

Be sure that a wide variety of fitness activities are offered to children. Youngsters often tire of the same activities, and motivation to exercise is decreased when children perceive the activities to be boring. Most adults who exercise have a favorite type of exercise. Children should be taught that there are many "roads to fitness" and that no single type of exercise is best for all people. Teach children a number of ways of exercising for fitness and how to modify each to assure that fitness benefits will accrue.

Effective Class Management

The amount of time available for physical fitness instruction is usually limited. The teacher must maximize the amount of activity within the physical fitness period. There are many useful practices which can be used to create an enjoyable and exciting environment. Good class management will make it easier and more efficient to move, group, and pair children for fitness activity.

Finding a Partner

A simple game of Back-to-Back (Dauer & Pangrazi, 1986) can be used for pairing youngsters. An added advantage of the activity is that it can be used to practice management skills as well as develop cardiovascular fitness. Children are instructed to move throughout the area and get back to back with a partner as quickly as possible. Students who don't find a partner in the vicinity run to the center of the area and raise their hand. Other children will be available as partners. If there is an extra child, the teacher can assign him/her to another pair or serve as the child's partner. This activity can be varied by changing the locomotor movement (skip, hop, gallop, etc.) as well as the position (toe to toe, elbow to elbow, etc.). The focus of the activity is learning to make the nearest person a partner as quickly as possible. This avoids the practice of looking for a friend or telling someone they are not wanted as a partner. It also minimizes the amount of time needed for choosing a partner. An additional stipulation can be placed on the activity asking that students choose someone who is their own height, weight, strength, etc. This is especially useful when exercises demand a partner of equal size and weight.

Many different challenges can be added such as find a friend, wearing the same color as you, who has a birthday in the same month as you, who has the same color eyes, etc.

Breaking into Small Groups

Small groups are used for many of the suggested fitness routines. An enjoyable management and fitness game used to form small groups is the Whistle Mixer (Dauer & Pangrazi, 1986). Youngsters move (any specified locomotor movement) around the area. The instructor then blows a whistle a certain number of times to specify the group size. Students quickly form groups based on the number of whistle blasts (4 blasts means groups of four). When they have the specified number of students in their group, they are required to sit down. For added excitement, it can be specified that the first group with the correct number and sitting down is the winner.

An advantage of using this activity is that it gives the teacher a rapid, easy way to organize children into groups of different sizes. Teachers and students begin to realize that management skills, as with all other skills, demand practice.

Dividing the Class in Half

It is common to divide a class in half to play many of the fitness games and sport drills. An easy way to do so is to signal the class to get back to back. Ask one partner to sit down while the other remains standing. Move the standing players first to one side of the area. Then ask the sitting players to move to the opposite side.

Moving into Formations

Students enjoy performing activities in various formations, and many instructors like to place their class into a circle or other formation for fitness routines. On a command "rectangle", for example, the class silently moves into a rectangular formation. The instructor can ask the shape to be made a specified number of steps larger or smaller. An element of excitement can be added by dividing the class into half and seeing who can make the formation first and with the highest quality (straight lines, full circle, etc.).

Teachers often ask students to make a circle, which is the hardest of all formations to construct. Placing 4 cones in a square to serve as perimeters will make it much easier in the learning stages of this approach. Remember that all circle activities can be done just as easily in square or rectangular formation.

Circle Formation

Since many activities are done in circle formation, an easy and active method for forming such a shape should be taught. An easy way is to ask students to "fall in" behind another person while moving throughout the area. As all students move into place behind one another, a large circle will result. The teacher can then move into the circle and enlarge or reduce the size of the circle as desired.

In summary, all the above methods use movement to initiate the action. Much warm-up activity can be done by moving easily throughout the area and moving into the desired formations. This allows the teacher to make a smooth transition from warm-up, into the desired formation, and ready for fitness activity. A side benefit is that there is much less off-task behavior when students are moving than when they are standing around, talking, counting off, or moving into position.

Fitness and the Physical Education Lesson

Physical fitness activities should be seen as part of the physical education lesson. It is unacceptable to throw out skill instruction in order to offer an extended period of fitness development. The two areas can and should co-exist, since both are used in adulthood to maintain fitness. On the other hand, it is important to include fitness instruction in every lesson. Too often, teachers decide that fitness will have to be deleted from the day's instruction due to a lack of time. Youngsters are left with the feeling that fitness is the least important part of physical education, and is only taught when there is enough extra time to do so.

Fitness instruction should be preceded by a two to three minute warmup period. There are many methods of warming up, i.e. stretching, walking and slow jogging, and performing various exercises at a slower than usual pace. It is important that youngsters be offered the opportunity to "loosen up" and prepare their bodies

for more strenuous activity, in order for them to develop proper exercise habits.

The fitness portion of the daily lesson, including warm-up, should not extend much beyond 10-15 minutes. Some might argue that more time is needed to develop adequate fitness; and undoubtedly, a higher level of fitness could be developed if more time were devoted to the area. However, the reality of the situation is that most teachers are offered 20 to 30 minute periods of instruction. Since skill instruction is part of a balanced physical education program, it becomes necessary to make some compromises in order to assure that all phases of the program are covered.

If approximately 2-3 minutes are allowed for warmup activity and 10 minutes for fitness, the importance of effectively and efficiently using the time becomes obvious. After an initial period of instruction, fitness activity should be continuous and demanding. Heart rates should be elevated into the target heart rate zone. Class management skills should be effectively used to assure that students are on task. In the upper grades, students can lead the activity in order to allow the teacher to move throughout the area and offer individualized instruction. Participation and instruction should be enthusiastic and focus on positive results. If the instructor does not enjoy physical fitness participation, it will be apparent to student. Above all, fitness activities should *never* be assigned as punishment. This teaches students that push-ups or running are things you do when you misbehave. The opportunity to exercise should be a privilege and an enjoyable experience. Take a positive approach and offer students the chance to jog with a friend when they do something well. This not only allows them the opportunity to visit with a friend, but to exercise on a positive note. Be an effective salesperson—sell the joy of activity and benefits of physical fitness to youngsters.

The Fitness Module

The fitness module is that portion of the daily lesson dedicated to the presentation of a wide variety of fitness activities. The following are suggestions to aid in the successful implementation of the fitness module:

1. Activities should be vigorous in nature, exercise all body parts, and cover the major components of fitness. All children are capable of strenuous workloads geared to their age, fitness level, and abilities. To be successful, exercises must adhere to FIT and other principles of exercise, and be within the capabilities of students.

2. Novel fitness routines comprised of sequential exercises for total body development are recommended alternatives to a year-long program of regimented calisthentics. A diverse array of routines which appeal to the interest and fitness level of the child should replace the traditional approach of doing the same routine day in and day out. The following sections of this chapter describe various fitness activities which can be used for children in the primary and intermediate grades.

3. The fitness routine should be conducted during the first part of the lesson. Relegating fitness to the end of the lesson does little to enhance the image of exercise. Further, by having the exercise phase of the lesson precede skill instruction, the concept, "You get fit to play sport, you don't play sport to get fit" is reinforced.

4. The teacher should assume an active role. Children respond positively to role modeling. A teacher who actively exercises with children, hustles to assist those youngsters having difficulty performing the exercises, and is able to make exercise fun begins to instill in children the value of an active lifestyle.

5. Various forms of audio or visual assistance should be used to increase the child's level of motivation. Background music, colorful posters depicting exercises, tambourine or drum accompaniment for activity, and other instructional media aids can assist in making vigorous activity more enjoyable.

6. The variety of fitness activities used in the module should be changed on a regular basis. To maintain the student's interest and further increase the child's knowledge about exercise, activities and routines which encourage total fitness development should be varied at regular intervals. Given the many exercises and activities available to develop fitness, this is not difficult.

7. When introducing a new activity, show children how it is to be done and identify it with a specific name. Give the purpose of the exercise and its value. Help children through the exercise in parts until the sequence of movement is mastered.

8. When developing workloads for chil-

dren, the two available alternatives are time and repetition. It may be more effective to base the number of exercise repetitions a child does on time, rather than a specified number, since this will allow the child to set personal limits within the time frame. Limits based on the capacity of each individual are most effective, but less easy to administer. Having the class perform as many sit-ups as possible in the time given will result in more children working at or near their potential than asking the entire class to complete fifteen sit-ups. Note that both time and repetitions are listed with each of the sample fitness routines in this chapter. This allows the teacher to make a decision as to the most effective approach for the particular setting.

The Yearly Plan

Fig. 5.1. Sample yearly fitness plan.

Grades K-2	Grades 3-4	Grades 5-6
1. Slow, Medium Fast	Slow, Medium, Fast	Student Leader Exercises
2. Challenge Activities	Fitness Games	Student Leader Exercises
3. Challenge Activities	Fitness Games	Student Leader Exercises
4. Jogging	Jogging	Continuous Movement Drills
5. Combination Movements	Continuous Movement Drills	Continuous Movement Drills
6. Fitness Games	Continuous Movement Drills	Continuous Movement Drills
7. Fitness Testing	Fitness Testing	Fitness Testing
8. Animal Movements	Sport Related Fitness Activity	Fitness Games
9. Hexagon Hustle	Parachute Activities	Parachute Activities
10. Parachute Activities	Parachute Activities	Parachute Activities
11. Challenge Activities	Interval Training	Sport Related Fitness Activity
12. Teacher Leader Exercises	Exercises to Music	Sport Related Fitness Activity
13. Exercises to Music	Exercises to Music	Jogging
14. Obstacle Course	Rope Jumping	Circuit Training
15. Combination Movements	Circuit Training	Circuit Training
16. Circuit Training	Circuit Training	Circuit Training
17. Continuous Movement Drills	Obstacle Course	Aerobic Dance
18. Animal Movements	Rope Jumping and Exercise	Aerobic Dance
19. Rope Jumping and Exercise	Rope Jumping and Exercise	Aerobic Dance
20. Circuit Training	Fitness Games	Interval Training
21. Challenge Activities	Aerobic Dance	Jogging
22. Fitness Games	Aerobic Dance	Jogging
23. Exercises to Music	Jogging	Student Leader Exercises
24. Combination Movements	Student Leader Exercises	Student Leader Exercises
25. Hexagon Hustle	Student Leader Exercises	Student Leader Exercises
26. Parachute Activities	Parachute Activities	Hexagon Hustle
27. Rope Jumping	Hexagon Hustle	Hexagon Hustle
28. Aerobic Dance	Hexagon Hustle	Hexagon Hustle
29. Fitness Testing	Fitness Testing	Fitness Testing
30. Rope Jumping and Exercise	Interval Training	Interval Training
31. Animal Movements	Exercises to Music	Obstacle Course
32. Exercises to Music	Exercises to Music	Obstacle Course
33. Aerobic Dance	Sport Related Fitness Activities	Fitness Games
34. Hexagon Hustle	Grass Drills and Partner Resistance	Grass Drills and Partner Resistance
35. Grass Drills and Exercises	Grass Drills and Partner Resistance	Grass Drills and Partner Resistance

The following is a suggested yearly plan of fitness instruction. It is offered as an example for planning the year's activities. Developing a yearly plan is important to assure that a wide variety of experiences are offered to learners. It also helps to plan for progress and assures that youngsters will receive a well-rounded program of instruction. An important point to remember is that physical fitness instruction must be planned in a manner similar to the skill development component of the lesson. For too long, little thought and concern has been given to fitness. Small wonder that youngsters grow up thinking that physical fitness can be achieved *only* through running laps and calisthenics.

When organizing a yearly plan for fitness instruction, consider the following points. Units of fitness instruction should vary in length depending on the age of the youngster. Primary grade children need to experience a wide variety of routines in order to maintain a high level of motivation. During these years, exposure to many different types of activities is more important than a progressive, demanding fitness routine. The first experiences to fitness instruction must be positive and enjoyable. As children mature, units can be extended to two weeks. In the fifth and sixth grades, units of three weeks allow for progression and overload to occur within units. In spite of the varying length of units, one principle must be followed: *There are many methods for developing fitness, none of which are best for ALL children.* Offer a wide variety of routines and activities so youngsters learn that fitness is not lockstep and unbending. The yearly plan should offer activities which allow all types of youngsters to find success at one time or another during the school year.

The yearly plan reveals another important criteria to consider when developing a fitness program. The routines become much more structured as youngsters grow older. Most of the activities listed for kindergarten through second grade children are unstructured and allow for a wide variation of performance. For older grade children, emphasis on proper technique and performance increases. However, this is not to imply that every student must do every activity exactly the same. It is unrealistic to think that an obese youngster will be able to perform at a level similar to a lean child. Allow for variation of performance while emphasizing the importance of "doing your best."

Physical Fitness Activities

The following activities for physical fitness are ordered from unstructured to structured and designed to be placed into the fitness module of the lesson. Refer to Figure 5.1 to determine the recommended number of weeks each activity or routine should be taught.

Slow, Medium, Fast Movements

A whistle is used to signal students to change from one tempo of locomotor movement to another. For example, if students were assigned walking as the locomotor movement, one whistle would signal a slow walk, two whistles a medium walk, and three whistles a fast walk. Different locomotor movements such as running, skipping, galloping, and sliding can be used for variation.

At regular intervals, students can stop and perform various stretching activities and exercises. This will allow short rest periods between bouts of activity. Examples of activities might be a one-leg balance, push-ups, sit-ups, touching the toes, and any other challenges.

Teaching Hint

Alternate non-locomotor activities with locomotor activities. **When youngsters are pushed too hard aerobically, they will express their fatigue in many different manners i.e., complaining, quitting, misbehavior, and sitting out. Effective fitness instructors are keenly aware of how far to push and when to ease up. Instruction must be sensitive to the capacities of youngsters!**

Challenge Activities

Children of all ages respond to challenges. Many different activities can be used to challenge youngsters to move toward various fitness goals. Much of the success of this approach centers on how the teacher presents various challenges. Youngsters must feel the enthusiasm of the teacher trying to encourage them to perform and accomplish the task. The following are examples of movement chal-

lenges which can be used to exercise various parts of the body. Remember, these are just suggestions and many more can be developed by both students and teacher. A combination of movements from different areas should be put together so children exercise the major parts of the body, i.e., upper body, abdominal region, legs, and cardiovascular system.

Arm-Shoulder Girdle Development

- Can you walk on your hands and feet?
- Can you walk on two hands and one foot?
- Can you walk on one hand and one foot?
- Can you walk in the crab position (tummy toward the ceiling)?
- In crab position, can you wave an arm at a friend? Can you wave a foot at a friend?
- How long can you hold a bridge position i.e., push-up position?
- Who can walk to this line in the push-up position?
- Who can scratch their back with the right hand while maintaining the push-up position?
- Can anyone clap their hands while holding the push-up position?
- Starting in the push-up position, walk the feet to the hands and back to the original position. Who can walk just one foot forward?
- From the push-up position, lower the body one inch at a time. How many people can move five inches?
- From the push-up position, turn over and face the ceiling.

Abdominal Development

- In a sitting position, who can pick up one leg and shake it? Who can pick up both legs and shake them?
- In a sitting position, who can lean the upper body backward without falling? How long can you hold this position?
- From a sitting position, who can lower themselves slowly to the floor? Now, can you sit up?
- In a supine position, who can lift their head and look at their toes? Can you see your heels? Who can see the back of their knees?
- In a supine position, who can "wave" a leg at a friend? Use the other leg. Use both legs.
- From a supine position, who can sit up and touch their toes?
- From a supine position, who can hold their shoulders off the floor?
- From a sitting position, who can lift their legs off the floor and at the same time touch their toes with their fingers?
- From a supine position, who can sit up with hands placed on tummy? With hands folded across the chest? With hands placed on top of head?

Legs and Aerobic Activity

- Who can run in place? Who can do 50 running steps in place without stopping?
- Who can do 40 skips or gallops?
- Who can slide all the way around the gymnasium?
- Who can hop 30 times on the left foot?
- Who can jump in place 40 times?
- Who can jump in place while twisting the arms and upper body?
- Who can do 10 skips, 10 gallops, and finish with 30 running steps?
- Who can hold hands with a partner and do 100 jumps?
- Who can jump the rope 50 times?
- Who can hop back and forth over this line from one end of the gym to the other?
- Try to run as fast as you can. How long can you keep going?

Combination Movements

The focus here should be on combining different types of locomotor movements with non-locomotor movements. Locomotor movements include walking, running, skipping, galloping, hopping, jumping, leaping, and sliding. Non-locomotor movements might include twisting, turning, rolling, rocking, bending, swinging, stretching, pushing, and pulling. Overload and progression can be developed by increasing the amount of time devoted to the locomotor movements and reducing the amount of non-locomotor movement. Movements can be stimulated by following the leader, announcing the sequence, or encouraging students to develop their own sequences. The following is an example of putting different combinations together in developing a fitness module for kindergarten through second graders.

- Run, freeze, and stretch.

- Skip, jump in place, and twist in 4 different ways.
- Perform 30 slide steps, change direction every 5 slides.
- Gallop, find a partner and pull, stretch with a partner.
- Try to do 35 skips, 20 hops, stop and do 3 different types of rocking movements.
- Balance on one body part, swing with a partner, run sideways throughout the area.
- Run, leap, roll, and rock. Repeat the sequence 5 times.
- Develop a sequence which includes walking, moving backwards, changing directions, stretching, and twisting. How many different sequences can you think of using these movements.

Animal Movements

Animal movements are excellent activities for developing fitness because they develop both cardiovascular endurance and strength. They are particularly enjoyable for primary grade children because they can mimic the sounds and movements of the animals. Most of the animal movements are done with the body weight on all four limbs. This assures that the upper body receives attention to stimulate muscular development. Children can be challenged to move randomly throughout the area, across the gymnasium, or between cones delineating a specific distance. The distance to move can be increased or the amount of time each walk is done can be raised in order to assure that overload occurs. The following are examples of animal walks which can be used. Many more can be created simply by asking students to see if they can move like a specific animal.

- Puppy Walk—move on all fours (not the knees). Keep the head up and move lightly.
- Lion Walk—move on all fours while keeping the back arched. Move deliberately and lift the "paws" to simulate moving without sound.
- Elephant Walk—move heavily throughout the area swing the head back and forth like the elephant's trunk.
- Seal Walk—move using the arms to propel the body. The legs are allowed to drag along the floor much as a seal would move.
- Injured Coyote—move using only three limbs. Hold the injured limb off the floor. Vary the walk by specifying which limb is injured.
- Crab Walk—move on all fours with the tummy facing the ceiling. Try to keep the back as straight as possible.
- Rabbit Walk—start in a squatting position with the hands on the floor. Reach forward with the hands and support the body weight. Jump both feet toward the hands. Repeat the sequence.

Fitness Games

Fitness games are excellent for cardiovascular endurance and create a high degree of motivation. Emphasis should be placed on *all* students moving. One of the best ways to assure that this occurs is to play games which do not eliminate players. This usually means that players who tag someone are no longer "it" and the person tagged becomes "it". This also makes it difficult for players to tell who is "it" which is desirable since it assures that players cannot stop and stand when the "it" player is a significant distance from them. If various games stipulate a "safe" position, allow that the player can only remain in this position for a maximum of 5 seconds. This will assure activity continues. The following are examples of games which can be played.

- Stoop tag—players cannot be tagged when they stoop.
- Back to Back tag—players are safe when they stand back to back with another. Other positions can be designated such as toe to toe, knee to knee etc.
- Train tag—form groups of three or four and make a train by holding the hips of the other players. Three or four players are designated as "it" and try to hook on to the rear of the train. If "it" is successful, the player at the front of the train becomes the new "it".
- Color tag—players are safe when they stand on a specified color. The "safe" color may be changed by the leader at any time.
- Elbow Swing tag—players cannot be tagged as long as they are performing an elbow swing with another player.
- Balance tag—players are safe when they balance on one body part.
- Push-up tag—players are safe when they are in push-up position. Other exercise positions such as sit-up, v-up, and crab position can be used.

- Group tag—the only time a player is safe is when they are in a group (stipulated by the leader) holding hands. For example, the number might be 4 which means that students must be holding hands in groups of 4 to be safe.

Obstacle Course

This approach makes use of the youngster's natural urge to overcome obstacles which involve going around, climbing, or moving under. Many commercial courses are made for the playground. These consist of parallel bars, tunnels, balance beams, monkey bars, chinning bars, figure 8 poles, and walls to climb. The drawback of these courses is that they never change and thus their novelty to youngsters decreases over time. Another problem lies in the fact that many cannot be used in inclement weather.

Homemade courses can be put together using equipment and apparatus commonly found in most physical education programs. The following is an example of a course that might be developed for use.

1. Figure Eight Run. Set out 3 to 6 cones spaced 5 yards apart. Students weave in and out of the cones.
2. Move over 5 hurdles. For primary grade children, broomsticks laid across cones make excellent hurdles.
3. Crab walk from one cone to the next.
4. Do the agility run 5 times between two cones.
5. Go through a tunnel formed by a tumbling mat set of four chairs. Use more than one mat to make the tunnel longer.
6. Climb to the top of a rope or hang for 20 seconds.
7. Move through 6 hoops held in position with carpet squares.
8. Leap over 5 carpet squares.

Teaching Hint

When starting youngsters in various circuits, spread them out over the distance of the course. This avoids having a large group of students standing in line, and prevents students from having to perform in front of other students who are waiting for their turn. Students who are faster can then pass others without slower youngsters feeling the stigma of being last.

Parachute

The parachute has been a popular item in elementary physical education for many years. Usually used to promote teamwork, provide maximum participation, stimulate interest, or play games, the parachute perhaps has been overlooked as a tool to develop physical fitness. By combining vigorous shaking movements, circular movements, and selected exercises while holding on to the chute, exciting fitness routines can be developed.

Instructional Procedures

1. The parachute should be held at the waist during instructional episodes.
2. Each exercise or movement should be started and stopped with a signal (i.e. "Ready, Go!" and "Ready, Stop!").
3. Background music or the tom-tom provides motivating rhythmical accompaniment.
4. Children should be spaced evenly around the parachute.
5. Functional rest periods (stretching activities) should be interspersed throughout the vigorous activity.

Routine

1. Jog in a circular manner, holding the chute in the left hand.
2. Stop. Grip the chute with two hands and make small and/or big waves.
3. Slide to the right for 16 counts. Repeat to the left for 16 counts.
4. Stop. Lie on back, legs under chute with knees flexed and feet flat on the floor. Pull the chute to the chin until it becomes taut. Perform sit-up exercises (12-16 repetitions) while holding on to the chute with both hands.
5. Hold chute with overhand grip and skip (20-30 seconds).
6. Stop. Face the center of the chute, spread legs slightly, and flex knees slightly. Pull chute down toward legs. Hold for 5-10 seconds. Repeat 3-6 times.
7. Run in place while holding the chute at different levels. Continue for 20-30 seconds.
8. Sit with legs extended under the chute and arms extended forward holding the chute taut. Using only the muscles of the buttocks, move to the center of the chute. Return to

original position. Repeat sequence 4-8 times.

9. Set the chute on the ground. Ask children to jog away from the chute, on signal (whistle, drum, etc.) return to chute at same pace (30 seconds).

10. Facing away from the chute and using an overhand grip, hold the chute above the head with arms extended and pull as hard as possible without losing balance. Hold position for 3-5 seconds. Repeat 4-6 times.

11. Jump up and down as quickly as possible while shaking the chute (15-20 seconds).

12. Make a dome by lifting the chute above the head and bringing it to the floor. Holding the edge of the chute down with both hands, do as many push-ups as possible before the center of the chute touches the floor.

13. Hop to the right for 8 counts, then to the left for 8 counts. Repeat 3-5 times.

14. Face the center and pull hard (tug-o-war) for 5-10 seconds. Repeat 3-5 times.

15. Conclude by making a dome and having everyone move inside the chute and sit on the rim with the back supporting the dome. Rotate trunk to the left for 10 seconds, then the right for 10 seconds.

Jogging

Jogging can be an excellent activity for developing fitness in youngsters when it is presented correctly. A large share of the experiences youngsters have had with jogging have involved running laps as fast as possible in order to "win the race." The fastest youngsters receive the praises of teacher and peers while the slow (and often obese) youngster is chided for being so slow. It is important for students to learn that when you run for your health, it is not a race.

Allow youngsters to find a friend of equal ability and randomly jog/walk through the playground area. The amount of jogging should be timed, with a reasonable starting time to be 4 minutes of continuing movement, alternated with a rest period of 2 minutes where stretching exercises are performed. A final bout of 4 minutes of movement can complete the fitness workout.

An alternate method is to jog/walk for 2 minutes, stop and stretch for one, move 2, stretch 1, move 2, and finish with 1-2 minutes of cool down stretching and walking. Students can freeze on signal wherever they are and follow the teacher. Another alternative is have each partner lead a couple of stretching activities. Whatever method is used, make sure emphasis is placed on the joy of moving.

Teaching Hint

When youngsters are allowed to choose a friend to jog or exercise with, it usually follows that they will find someone of similar ability. This automatically gears the activity to their fitness and ability level. It also assures that the activity will be socially enjoyable and meaningful for the students. Most adults like to exercise with others and it is not unrealistic to expect that children like to exercise with friends.

Students should run in any direction, with a friend, and be able to visit while jogging. Ask students to jog for a specified amount of time rather than distance. This will allow them to individualize the amount of jogging they do based upon their ability and condition.

The following are some suggestions which might help increase a youngster's level of motivation to jog. All of them are designed to improve physical conditioning and to increase the amount of knowledge allied to the experience.

1. Set up a number of exercise trails on the playground. Trails should be of differing lengths so students can increase their workload as their fitness levels improve. Encourage them to keep track of their "mileage" by recording it on a class chart.

2. Jog across the USA by posting a map of the country in the classroom. Each day, the mileage of each student is added together and the distance plotted on the map. This tends to bring the class together for a common cause and all can feel as though they are making a meaningful contribution.

3. Set up a large clock in the playground area with a highly visible second hand so students can learn to monitor their heart rate. Encourage them to maintain the heart rate in the target zone for 5 to 10 minutes prior to participation in recess activities. When students are involved in activities which demand longer bouts of activity, i.e., soccer, team handball, and tag games, have them stop periodically and monitor their heart rate.

4. Develop a jogging course which utilizes playground equipment for strength development. Most playgrounds have chin-up bars, monkey bars, climbing equipment, and parallel bars. Organize a red, white, and blue circuit whereby each color indicates a greater workload. Develop the circuit so youngsters have to jog between each strength development station.

5. Develop an afterschool jogging and/or fitness club. A great deal of time and energy is spent on developing sport programs for children even though it is well documented that a large majority of students do not possess the genetic traits to be outstanding athletes. This is the attractiveness of a fitness club: every student, regardless of genetic talent, can improve his/her level of physical fitness. The club should focus on fitness gains and teach a large number of aerobic activities besides jogging, i.e., bicycling, hiking, power walking, cross-country running, and rope jumping. Students can learn to get fit in order to play sports, rather than the typical pattern of playing sports with the hope (usually unrealized) of developing physical fitness.

Interval Training

Interval training is an excellent activity for young children since they recover quickly from fatigue. Interval training involves controlling the work and rest intervals of the participant. Intervals of work (large muscle movement dominated by locomotor movements) and rest (dominated by non-locomotor activity or walking) can be measured in time. Other ways of measuring intervals is to count repetitions or distance covered. The most practical method to use with elementary school children is to time the alternated work and rest periods.

Interval training can also be done by monitoring the heart rate. The work interval continues until the heart rate reaches the target zone and the rest interval continues until the heart rate returns to approximately 120 to 140 beats per minute. The simplest example would be to alternate jogging and walking. With elementary school children, however, this can be quite boring. The following are examples of some activities which can be alternated with rest activities.

High Fives: youngsters run around the area and, on signal, run to a partner, jump and give a "high five". Various locomotor movements can be used as well as different styles of the "high five".

Over and Under: students find a partner. One partner makes a bridge on the floor while the other moves over, under, and around the bridge. This continues until a signal is given to change positions. This assures that one child will be moving (working), while the other is resting. Try different types of bridges and movements to offer variety to the activity.

Rope Jump and Stretch: each student has a jump rope and is jumping it during the work interval. Upon signal, the student performs a stretch using the jump rope. An example would be to fold the rope in half and hold it overhead while stretching from side to side and to the toes.

Glue and Stretch: working with a partner, one partner is "it" and tries to stick like glue to their partner. Students should move athletically, under control. The person who is not "it" tries to elude the other. Upon signal, "it" leads the other person in a stretching (resting) activity. On the next signal, the roles are reversed.

Rubber Band: students move throughout the area. On signal, they time a move to the center of the area. Upon reaching the center simultaneously, they jump upward and let out a loud "yea!" and resume running throughout the area. The key to the activity is to synchronize the move to the center. After a number of runs, take a rest and stretch, or walk.

These are examples of movements and activities which can be done with interval training. A valuable addition to the activities is music. An effective approach is to prepare a tape recording of popular music. For a start, tape 30 seconds of music followed by 20 seconds of rest. Continue taping a number of these alternating music and silent intervals. The music squence will direct youngsters to perform the work interval while the silence will signal it is time to stretch or walk. This frees the teacher to help youngsters who are in need and assures that the intervals can be timed accurately. As the youngsters become more fit, the length of the music bouts can be increased by making a new recording. Changing the music on a regular basis keeps children motivated.

Exercises for Developing Fitness Routines

Selection and incorporation of exercises into the fitness module should be based on the fitness, abilities, and interest of children and the potential for the exercise to contribute to total body development. To be effective, fitness routines must be comprised of various exercises which develop components of skill and health related physical fitness. Exercises, in themselves, are not sufficient to develop cardiovascular endurance. Additional exercise, in the form of aerobic activity, is needed to round out fitness development.

There are innumerable exercises which effectively place demands on the muscles of the arm and shoulder girdle, lower back, leg, and abdominal area. Some exercises and exercise practices, however, pose inherent hazards to long-term musculoskeletal growth and development as well as possible injury. Cautious selection of exercises, based on sound principles, is a better approach to fitness than an overzealous attempt which may place unnecessary demands on the child. Usually, any potentially harmful exercise activity can be prevented through knowledgeable instructors, proper technique, and careful adherence to the guidelines for fitness development discussed in Chapter 2.

Exercises to Avoid

The following are examples of potentially harmful exercises or practices which should be avoided when selecting fitness activities for children.

1. Straight-legged sit-ups place unnecessary demands on the muscles of the lower back which may cause excessive lower back curve. The sit-up, and its many variations, should be performed with a smooth curling movement with the chin always tucked to the chest. This not only makes for a safe exercise, it also assures proper isolation of the abdominal muscles.

2. Ballistic (forceful bouncing) stretching activities should be avoided. Static (slow) stretching which applies smooth and constant pressure on muscle groups is effective in improving flexibility and considerably safer. Children should be encouraged to stretch to the point of pull, allow the muscles to relax naturally, and then stretch further. Control, slow and sustained, is the watchword for proper stretching technique.

3. Exercises that cause hyperextension of the neck could cause pinching of the arteries and nerves at the base of the skull and should be avoided. Activities such as inverted bicycle, wrestler's bridge, and neck arching, which place undue pressure on the neck, should also be excluded. Comfortable rotation of the neck is recommended as a safe exercise for neck muscle development.

4. Full squats, or deep knee bends, may cause damage to the growth and development of the knee joints and should be avoided. Exercises which extend the knee to 90 degrees are effective for proper development of the knee joint.

5. Stretching activities done from a standing position could cause children to hyperextend the knee, excessively stretching ligaments. Youngsters should be allowed to relax, even flex, the knee joint during standing stretches. A general rule of thumb is to have children judge their own range of motion.

6. Exercises which cause hyperextension in the lower back should be avoided. Specific examples of contraindicated exercises are back bends, straight leg raises from a supine position, straight-legged sit-ups, and prone back arch. There are much better ways to exercise the back than arching.

Categories of Exercises

Selected exercises are grouped into categories based on their contribution to fitness in the following areas: (1) arm and shoulder girdle, (2) flexibility, (3) leg, and (4) trunk and abdominal. In any one fitness routine, the number of exercises included should be 6-12. Included in each routine should be two exercises from each of the four groups plus sufficient aerobic activity to elevate the heart rate into the training zone. It is recommended that exercises, as well as fitness routines, be changed on a regular basis.

Recommended exercises are presented under each of the four major categories. The starting position, movement and counting sequence, and variations are listed with each exercise.

Exercises for the Arm and Shoulder Girdle Region

Arm and shoulder girdle exercises in this section include free-arm, arm-support, or partner assisted types.

Arm Circles

Starting Position: Stand erect, with feet about shoulder width apart, and arms straight and extended to the side.

Movement: Rotating from the shoulders, simultaneously circle arms forward or backward.

Variations: (1) With palms up or down, make small, medium, and large circles. (2) Circle the arms in alternate directions.

Crab Kick

Starting Position: The body is supported by the hands and feet, with the back parallel to the floor. The knees should be bent at right angles and the buttocks clearly off the floor.

Movement: Kick the right leg up and down (counts 1 & 2). Repeat with left leg (counts 3 & 4).

Variations: In the crab position: 1. Extend the right leg so it rests on the floor (count 1). Return right leg to starting position while extending left leg (count 2). 2. Extend both legs forward (count 1). Return to starting position (count 2). 3. Move forward, backward, sideward, and in various patterns. 4. Lift the right arm so it points to the ceiling and return it to its original weight-bearing position (counts 1 & 2). Repeat with left arm (counts 3 & 4).

Fig. 5.2. Variation of crab kick.

Fig. 5.3. Partner pull-up.

Partner Pull-ups

Starting Position: One partner stands erect, with feet spread slightly more than shoulder width apart and arms extended toward the floor. The other child lies on his or her back between the feet of the person standing and grasps the partner's hands.

Movement: Keeping the body rigid and using only the arms, the partner on the floor pulls up approximately 12-18 inches off the floor (count 1) and returns to starting position (count 2).

Variations: use different hand grips (i.e. hands grasp wrists, shake-hands, interlock fingers, etc.)

Push-up

Starting Position: Assume a front leaning rest position, with body straight and hands flat on the floor. Fingers should point forward.

Movement: Bending from the elbows, slowly lower the body until the chest touches the floor (count 1). Using only the arms, return to starting position (count 2).

Variations: 1. Change the movement sequence. For example, halfway down (count 1),

to the floor (count 2), halfway up (count 3), to starting position (count 4). 2. Alter the starting position. Children who have difficulty supporting their weight may be successful if the push-up sequence is completed while resting part of their body weight on the knees. 3. Varying the hand position can make the exercise more challenging.

Pull-ups

Starting Position: Hang from a horizontal bar. Feet should not touch the floor.

Movement: Keeping the body straight, use only the arms to pull the body up until the chin is above the bar (count 1). Return to starting position (count 2).

Variations: 1. Hang from a low bar, heels on the floor, with body straight from feet to head. Lower body to floor (count 1). Pull up, keeping body straight, until chest touches bar (count 2). 2. Change hand grip (i.e. palms forward, palms away, or one-hand).

Exercises to Increase Flexibility

Numerous exercises develop and maintain flexibility. Those included in this section specifically exercise the muscles of the lower back and posterior thigh. Students need to be instructed and continually reminded that, to decrease the possibility of muscle injury, all stretching exercises should be done slowly (static stretching). While flexibility exercises are specific and important to total fitness development, they can also serve as functional rest periods during vigorous fitness activities and should be interspersed throughout exercise routines accordingly.

Bend and Stretch

Starting Position: Stand erect with feet slightly more than shoulder width apart and arms extended above the head.

Movement: Gradually bend forward for seven counts trying to touch the floor between the feet. Flex knees if necessary. Return to starting position on the eighth count.

Variations: 1. Bend sideways or backward. 2. Change leg positions (legs together, cross legs, or spread legs farther apart).

Knee-to-Chest Curl

Starting Position: Lie on back in a curled position with forearms behind knees and face tucked into knees.

Movement: Pull knees to chest and curl the pelvis off the floor. Hold in stretched (curled) position for 15-20 seconds. Return to starting position.

Variation: In curled position rock back and forth or side to side on lower back.

Sitting Stretch

Starting Position: Seated on floor with legs spread and extended. Arms are extended above the head with one hand on top of the other.

Movement: Bend from the hips and reach forward slowly for seven counts holding the seventh count at the farthest point reached. Return to the starting position on the eighth count.

Variations: Bend to the left on the first count and gradually move to the right for the seventh count. Return to the starting position on the eight count.

Leg Hug

Starting Position: Lie on back with feet flat on the floor, knees flexed, and head resting on the floor. Arms should be parallel to the torso and resting on the floor.

Movement: Arch back and lift hips approximately six to eight inches off the floor and hold for several counts. Relax and use hands to pull knees to chest and hold for several counts.

Variations: 1. Alternate legs during the pulling phase of this exercise. 2. Fold arms on the chest. Lift the hips off the ground (hold for several counts). Return to starting position.

Sit and Twist

Starting Position: Sit on floor with legs crossed, trunk erect, and eyes looking straight ahead. Arms should be relaxed and in front of body.

Movement: Twist body to right, place hands on outside of thigh and pull. Hold for several counts. Return to standing position. Repeat on left side of the body.

Variations: Place beanbag or other object behind student and see if they can reach it by slowly twisting from the trunk.

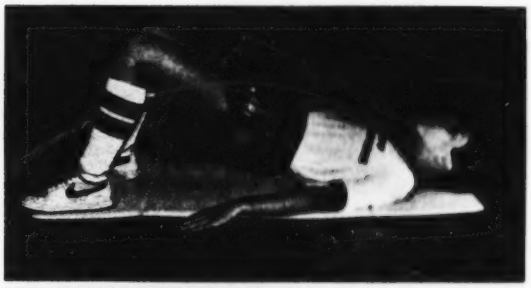

Fig. 5.4. Leg hug (phase 1).

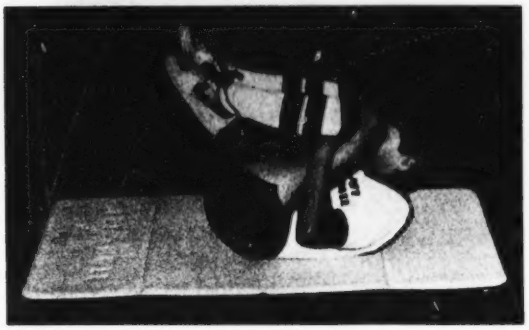

Fig. 5.5. Leg hug (phase 2).

Exercises for the Leg Region

All locomotor movements and other types of physical activity (i.e. rope jumping, cycling, etc.) can be used to develop leg strength and endurance. In addition to developing muscular strength and endurance, most leg exercises also improve agility. Exercises in this section are designed for use in structured fitness routines and have potential aerobic benefits.

Treadmill

Starting Position: Assume a push-up position with one leg brought forward placing the knee under the chest.

Movement: Reverse the position of the knees, bringing the extended knee forward (count 1). Return to original position (count 2).

Variations: Change the cadence of the exercise (slow to fast).

Run in Place

Starting Position: Standing erect.

Movement: Alternate bringing knees up in front of body. Be sure arms are in correct position for running.

Variations: 1. Extend arms to the side, forward, and above the head. 2. Bring heels up behind the body when running. 3. Run in small circles, making figure eight, and other patterns. 4. Change tempo.

Jumping Jacks

Starting Position: Stand at attention.

Movement: Jump to a straddle position with arms above head (count 1). Return to starting position (count 2).

Variations: 1. From forward stride position move feet forward and backward. 2. Rotate the body in circular manner while performing the jumping jack. 3. Cross the feet on the return move (count 2). 4. Alternate kicking leg up and forward on count 1. 5. Change the position that the hands are moved to on count 1.

Stride Jump

Starting Position: Stand with one leg forward and the other back, with the knees bent in a half squat position. Hands are clasped behind neck with elbows pointing to the side.

Movement: Jump straight up, and reverse positions of the legs (count 1). Return to starting position (count 2).

Variations: 1. Move sideways, forward, backward while performing the exercise. 2. Hold arms to the side or above head.

Fig. 5.6. Sit and twist.

Fig. 5.7. Treadmill.

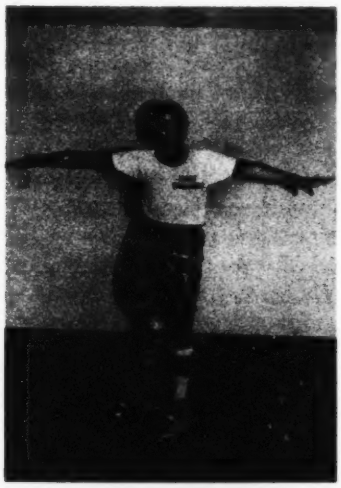

Fig. 5.8. Variation of running in place.

Fig. 5.9. Variation of jumping jack.

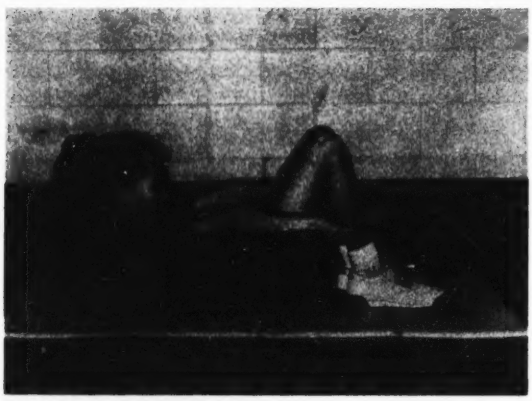

Fig. 5.10. Partial curl.

3. Move arms forward and backward in opposition to leg movement.

Power Jumper

Starting Position: Crouched, with knees flexed and arms extended backward.

Movement: Jump as high as possible and extend arms upward and over head.

Variations: 1. Jump and turn. 2. Change the number of repetitions to be completed during a certain time period. 3. Jump and perform task (i.e. heel click, clap hands, imagine catching a thrown pass or snaring a rebound).

Exercises for the Trunk and Abdominal Region

For most abdominal exercises the child starts from a supine position (on back) on the floor or mat. Most movements begin with a curl-up, rolling the head up first followed by the shoulders. To ensure maximum activity for the abdominal muscles and prevent the hip flexors from overexertion, the chin should always be in contact or near contact with the sternum (chest). Further, the bent knee position places greater demand on the abdominal muscles. For the most part, exercises for the abdominal region also benefit functioning of the lower back. Movements for the trunk and abdominal region should be large, vigorous, and done throughout the full range of motion.

Partial Curl

Starting Position: Supine, with knees flexed and feet flat on the floor. Arms extended forward and off the floor.

Movement: Keeping the chin tucked to the chest, roll the shoulders forward as far as possible without lifting the lower back off the floor (hold for seven counts). Return to starting position (count 8).

Sit-up (AAHPERD Health Related Physical Fitness Test)

Starting Position: Lie on back, with knees flexed and arms folded across chest with hands on opposite shoulders. Chin tucked to chest and shoulders slightly off the floor.

Movement: Curl up until forearms touch thighs (count 1). Return to starting position (count 2).

Leg Extension

Starting Position: Sit on the floor with legs extended and hands on hips.

Movement: Sliding the feet on the floor, bring heels as close to the seat as possible (count 1). Return to starting position (count 2).

Fig. 5.11. Leg extension (count 1).

Fig. 5.12. Leg extension (count 2).

Variations: The exercise can be made more challenging by changing arm positions (i.e. extended to the side, in front, and folded across chest).

Trunk Twister

Starting Position: Stand erect with feet about shoulder width apart. Hands on hips.

Movement: Bend downward (count 1). Rotating the trunk, bend to the right (count 2). Bend backward (count 3), bend to the left (count 4). Return to the starting position.

Variation: Alternate direction of rotation.

Squat Thrust

Starting Position: Standing at attention.

Movement: Drop to a squat position, with the hands flat on the floor, about shoulder width apart (count 1). Fully extend legs back, keeping them together (count 2). Pull legs to the squat position (count 3). Return to the starting position (count 4).

Variations: To place greater demands on the abdominal muscles, add an extra set of leg extension and return to squat with each repetition.

Teacher Leader Exercises

There are certain advantages in having the teacher lead the class through a sequence of exercises. First of all, the teacher is able to display their own enthusiasm toward exercise. Secondly, the pace (intensity) of the activity can be controlled. Finally, by leading the exercises, the teacher creates a good opportunity to practice management skills.

Instructional Procedures

1. The teacher should change their location on the floor after each exercise.
2. Exercise cadence should be directed at the "norm" of the class.
3. Daily altering of the class formation (scatter, squad, circular, etc.) can add variety to the routine.
4. Providing a musical background will increase the motivation level of the children.

Exercise Routine

Exercise	Repetitions/Time
Arm Circles	8-12 (8 forward, 8 backward) or 30 seconds
Bend and Stretch	8-12 or 30 seconds
Treadmill	12-15 (4 counts) or 25 seconds
Sit-up	12-15 or 45 seconds
Single Leg Crab Kick	8-12 (2 left, 2 right) or 30 seconds
Knee to Chest Curl	3 (hold each curl for 15 seconds)
Run in Place	30 seconds
Trunk Twister	8-10 or 45 seconds

Conclude routine with 2-4 minutes of jogging, rope jumping, or other continuous activity.

Student Leader Exercises

There are times when students should be given an opportunity to lead either an exercise or the entire routine. To be effective in instructing their peers, student leaders should have had prior practice performing the exercise.

Exercise Routine

Exercise	Repetitions or Time
Push-up	6-12 (2 counts) or 30 seconds
Sitting Stretch	8-12 or 45 seconds
Jumping Jacks	15-20 or 30 seconds
Leg Extension	10-15 or 45 seconds
Push-up	6-8 (4 counts) or 40 seconds
Leg Hug	4-6 (hold counts 1 & 2 for 10 seconds)
Stride Jump	10-15 or 45 seconds
Squat Thrust	8-12 or 45 seconds

Conclude routine with 2-4 minutes of jogging, rope jumping, or other continuous activity.

Instructional Procedures

1. The teacher should spend time before or after class instructing leaders how to execute and count the exercise.
2. Provide leaders with index cards explaining and graphically describing the exercise.
3. Predetermine the number of repetitions to be completed.
4. Ask for volunteers, or assign willing students to be leaders. No child should be forced into a position of leadership which could result in failure for both the youngster and the class.
5. The teacher should move freely among the class, helping those students who require additional assistance in performing the exercises successfully.

Exercises to Music

The use of music adds a great deal of motivation to exercise activities for people of all ages. There are many commercial routines available, but most of them are made for a specific group and therefore may be too easy or difficult for youngsters to perform. Another problem is that they cannot be changed, which makes it next to impossible to develop progression and overload.

Many teachers have had excellent success with making exercise tapes using a tape recorder and popular music. Most media departments in schools have equipment which will allow music to be taped with vocal instructions dubbed onto the music track. The advantage of this approach is that the teacher can play the tape which has commands for starting and stopping the exercises. This frees the teacher to move around and help students in need. Refer to the section on Teacher Leader Exercises for guidelines in developing a fitness routine which develops all body parts.

Another approach is to have students bring records and lead exercises based on their music. A group of students might work together to develop a routine as part of an out-of-class assignment.

Primary grade exercises to music should focus on locomotor movements and various movement challenges. The use of music is an excellent beginning for developing the sense of moving to external rhythms.

Teaching Hint

Taped music can be an excellent tool for timing the length of exercise bouts. For example, if doing Random Running, students could run/walk as long as the music is playing and stretch when it pauses. If the music is pretaped, it will free the teacher from having to keep an eye on a stopwatch. Other exercise modules which work well with music are circuit training, Grass Drills, Continuous Movement Routines, and Rope Jumping Exercises.

Aerobic Dance

Aerobic dance is a popular fitness activity for children of all ages. It has the advantage of being demanding, aerobic activity supported by upbeat music. For primary grade children, the approach should be to develop activities which are rhythmic, yet uncomplicated. A common and highly effective approach is to use a "follow the leader" technique. The teacher can lead during the learning stages of the routine and gradually allow students to lead each other.

In developing routines for intermediate grade children, movement changes are usually

dictated by changes in the music. The most common pattern is to change every 8 or 16 beats. In order to make it easier for children to remember the sequences, activities can be listed on a large poster board. Routines often motivate more children when exact adherence to the routine is not demanded. Often, when everyone is expected to be exactly in the same place at the same time, it appears to students that precision rather than fitness is the goal. Remember that the primary goal is to develop a positive feeling toward activity, rather than developing a highly polished performance.

The activities should be appealing to both boys and girls. If the activities demand a great deal of rhythmic motor coordination, it is possible that boys will be turned off and see the activity as unimportant or "feminine" in nature. Large muscle activities which promote cardiovascular activity should form the basis of the routine. Once again, the enthusiasm of the teacher can have an impact on the energy and excitement level of the class.

The following are examples of activities which can be used to create routines. In developing routines, start with a few simple activities such as running steps, and gradually increase the complexity of the activities.

Running and Walking Steps

Directional running steps—forward, backward, diagonal, sideways, and turning.

Rhythmic runs—run and do a specific movement on a specified beat. The first and fourth beats are the most commonly used and easiest to follow. Examples of movements which might be used are a knee lift, clap, hop, or jump turn.

Running variations—lift the knees, lift and slap the knees, or kick up the heels.

Runs with arms in various positions—carry the arms in different positions such as on the hips, above the head, extended at shoulder height. Run and clap the hands with arms extended in at different levels and positions.

Exercises on the Floor

Many different exercises can be done rhythmically during a routine. It is important to use the exercises as a respite from the intense cardiovascular demands of the large muscle activity.

Sit-ups—these can be modified and performed to 2, 4, or 8 beats of the music. For example, a four count sit-up might be done as follows: 1) sit-up to knees, 2) touch the toes, 3) return to knees, and 4) return to the floor. V-ups can be held for four counts followed by a 4 count rest.

Push-ups—can be done to 2 or 4 counts. When doing 4 count push-ups, the body is lowered and raised half the distance to the floor each count.

Side leg raises—laying on the side,the top leg is raised and lowered to the beat of the music.

Crab kicking—starting in crab position, alternate extending one leg forward at a time. The rhythm should be similar to running in place.

Jumping jacks—use different feet and hands positions and movements. For example, jump with the arms alternately extended upward and then pulled into the chest. Move the feet from side to side or forward and backward instead of the usual movement.

Bounce Steps

Bounce steps consist of jumping in place rhythmically. They are excellent beginning steps since they are not complex and encourage maintenance of an even rhythm.

Bounce and clap—clapping can be done on every beat, every other beat, or every fourth beat.

Bounce, turn, and clap—the body can be turned a quarter or half turn with each bounce.

Bounce and move—the weight is transferred from side to side, forward and backward, or in a diagonal direction.

Bounce and twist—extend the arms at shoulder level and twist the lower body back and fourth on each bounce.

Bounce with floor patterns—make various floor patterns with a specified number of bounces. For example, move in a circle, triangle, square, etc. using 16 bounces.

Bounce with kick variations—perform different kicks such as knee lift, kick, knee lift and kick, double kicks, and knee lift and slap knees.

Using Equipment

A large variety of equipment can be used to enhance the experience for youngsters. Chil-

dren really enjoy the opportunity to manipulate a jump rope, ball, hoop, or beanbag. The following are ideas which might be used.

Jump rope—perform many of the basic steps such as forward, backward, slow, and fast time. Many of the steps described in the jump rope section can be used depending on the skill of the students.

Hoop—rhythmically swing the hoop around different body parts. Hula hoop using different body parts. Use the hoop as a jump rope and jump rhythmically.

Balls—develop different routines by combining locomotor movements with bouncing, tossing, and dribbling skills.

Continuous Movement Drills

The class is instructed to walk in a circular pattern, always maintaining a safe distance from their classmates. Throughout the routine, the teacher will change the locomotor movements, direction of movement, and frequently stop the class to perform selected exercises. Children of all ages enjoy being challenged by this fast-paced sequence of fitness activities and should derive aerobic benefits from the locomotor activities which are interspersed between exercises.

Instructional Procedures

1. To avoid singling out the slower child, change the direction of the movement regularly. Children who continually lag behind can be moved toward the inner part of the circle. The faster children can pass them on the outside.
2. The teacher should be located inside the circle. This position allows ready access to those students having difficulty with either the movements or exercises.
3. Use boundary cones or lines on the floor to mark the perimeter of the circle.

Exercise Routine

Exercise or Movements	Repetitions or Time
Jog	15-20 seconds
Double-leg Crab Kick	8-12 (4 counts) or 30 seconds
Skip	15-20 seconds
Sit and Twist	4-6 (5 seconds on each side)
Slide (clap when feet come together)	15-20 seconds
Jumping Jacks (Variations)	10-15 (4 counts) or 30 seconds
Crab Walk (fast forward)	10-15 seconds
Sit-up	8-12 or 45 seconds
Hop to the middle of the circle on the right foot.	
Hop to the original position on the left foot.	
Push-up	8-12 or 40 seconds
Gallop	25-30 seconds
Leg Hug	3-6 (hold counts 1 & 2 for 10 seconds)
Walk. Reach arms to sides and perform arm circles.	
Power Jumper	8-12 or 30 seconds
Trot	15-20 seconds
Squat Thrust	8-10 or 40 seconds

For proper cool down, conclude routine with approximately 2-3 minutes of stretching.

Circuit Training

In circuit training, each of several (6-10) stations has designated exercises for a specified component of fitness. Students are assigned to small groups and move from station to station, in a prescribed manner, completing the fitness tasks at each station. Each station should offer several exercises which place demands on the same muscle groups and vary in degree of difficulty. Figure 5.13 is an example of an eight station circuit.

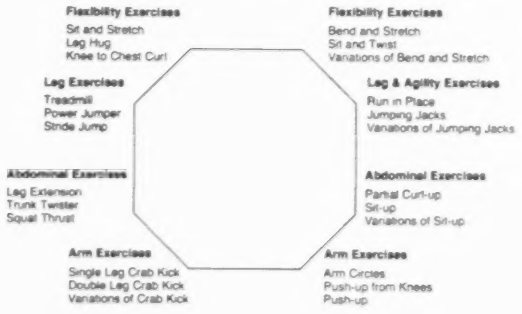

Fig. 5.13. Eight station circuit.

Instructional Procedures

1. Exercises should be familiar to children and within their capabilities.
2. The exercises at each succeeding station should make demands on different parts of the body. This avoids undue fatigue and offers a greater variety in exercise.
3. The teacher should freely move around the area assisting the children who are having difficulty with certain exercises.
4. Children should be encouraged to correctly perform as many repetitions of the exercise as possible in the time allotted.
5. The movement from station to station should vary and offer cardiovascular benefits. Performing various locomotor movements around the entire circuit, passing the station just completed, and finishing in a ready position for the exercises at the next station is an example of a rotational movement. Animal walks also can be used to move from station to station.
6. There should be between 4-6 children at each station.
7. Equipment (i.e. jump ropes, playground balls, hula hoops, etc.) can add variety to the exercise station.
8. The exercise work load can be varied by increasing the time spent at each station. The recommended time at each station is 15-30 seconds.
9. Signals should be used to start the exercise interval and begin the rotation from station to station. Exercise tapes can be recorded which provide background music for the exercise bout and silent time for moving to the next station.
10. Stations which provide functional rest periods should be inserted following the more demanding exercises.
11. Colorful posters identifying and illustrating the exercises can be educational and motivational.

Rope Jumping and Exercise

Rope jumping is an activity which has the potential for improving cardiovascular fitness, leg strength, and agility. Bouts of rope jumping can be alternated with exercises to develop other components of physical fitness.

Instructional Procedures

1. Children should be in extended squad or scatter formation. Each child should be a safe distance from the person closest to them.
2. Since children will incur greater fitness benefits if they are reasonably skilled at rope jumping, this routine should be used only after the basic steps have been mastered.
3. Children should be instructed to set the rope down at their side while performing the exercises.
4. Proper rope jumping form should be stressed at all times.
5. Cassette tapes can be recorded which signal the start and stop of the jumping and exercise segments, respectively.

Exercise Routine

Activity	Repetitions or Time
Basic Jumping (Forward Turning)	20-30 seconds
Single Leg Crab Kick (4 counts)	10-15 repetitions or 30 seconds
Basic Jumping (Backward Turning)	20-30 seconds
Partial Curl (8 counts)	8-10 repetitions or 45 seconds
Jump and Slowly Turn Body	20-30 seconds
Bend and Stretch (8 counts)	8-10 repetitions or 45 seconds
Hop on One Foot (Forward Turning)	10-15 seconds
Change Feet (Forward Turning)	10-15 seconds
Arm Circles (8 counts)	10-15 repetitions or 30 seconds
Rocker Step	20-30 seconds
Sit and Twist (8 counts)	8-10 repetitions or 30 seconds
Free Jumping	20-30 seconds
Leg Extension	8-12 repetitions or 30 seconds
Free Jumping	20-30 seconds
Sit and Stretch (8 counts)	8-10 repetitions or 30 seconds

Hexagon Hustle

A large hexagon is formed using six cones. The student moves around the hexagon changing movement patterns every time he reaches one of the six points in the hexagon. On the teacher's command, the "hustle" stops and selected exercises are performed.

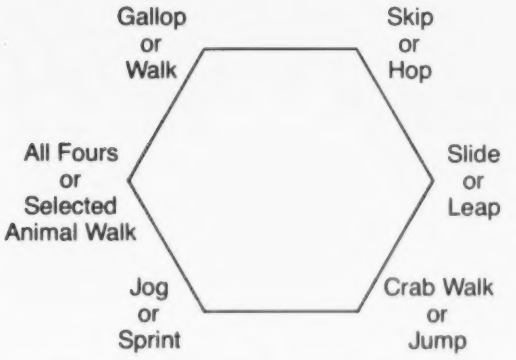

Fig. 5.14. Example of Hexagon Hustle activities.

Instructional Procedures

1. To create a safer environment, children should move in the same direction around the hexagon.
2. Posters with colorful illustrations should be placed by the cones to inform children of the new movement to be performed.
3. Faster children should be encouraged to pass on the outside of slower children.
4. The direction of the "hustle" should be changed after every exercise segment.

Exercise Routine

Exercise	Repetitions or Time
Hustle	20-30 seconds
Push-up from Knees	8-12 repetitions or 30 seconds
Hustle	20-30 seconds
Bend and Stretch (8 counts)	6-10 repetitions or 30 seconds
Hustle	20-30 seconds
Jumping Jacks (4 counts)	10-15 repetitions or 30 seconds
Hustle	30-40 seconds
Sit-ups (2 counts)	8-12 repetitions or 45 seconds
Hustle	30-40 seconds
Double Leg Crab Kick (2 counts)	8-12 repetitions or 30 seconds
Hustle	20-30 seconds
Sit and Stretch (8 counts)	6-10 repetitions or 45 seconds
Hustle	10-20 seconds
Power Jumper	6-10 repetitions or 30 seconds
Hustle	10-20 seconds
Squat Thrust (4 counts)	6-10 repetitions or 45 seconds

Conclude Hexagon Hustle with relaxing exercises.

Grass Drills/Partner Resistance Exercises

Partner resistance exercises are a form of isometric exercise useful for the development of strength. Since they have no aerobic benefits, partner resistance exercises should not be used as the only activities for a fitness module. Resistance exercises interspersed with vigorous activities can create the basis for a well-rounded fitness routine. Following are some guidelines for resistance exercise:

1. Exercises should be simple and enjoyable.
2. Children should be matched with a partner of equal size and strength.
3. Exercises should be performed through the full range of motion at each joint.
4. The approximate duration of each exercise episode should be 8-12 seconds.
5. Signals should be used to start and stop the resistance exercise.

Suggested Partner Resistance Exercises

1. *Arm curl:* exerciser keeps hands open with palms up and bends the arms at the elbows, keeping the upper arms against the sides. Partner places fists in the exerciser's palms. Exerciser tries to curl the forearms upward to the shoulders. To develop the opposite set of muscles, push down in the opposite direction, starting at the shoulder level.
2. *Fist pull-apart:* exerciser places fists together in front of body at chest level. Exerciser attempts to pull the hands apart while partner forces them together. Vary the exercise by trying with fists apart and pushing them together.

Fig. 5.15. Fist pull apart.

3. *Eagle:* exerciser stands with arms extended straight out to the sides. Partner holds exerciser's arms at the elbows. Exerciser tries to move arms down to the side of the body. Vary the exercise by having exerciser move the arms to an extended straight above head position or in front of the body.

4. *Turtle shell:* exerciser is on hands and knees with head up. Partner pushes lightly on exerciser's back while exerciser attempts to curve the back like a turtle's shell.

5. *Back stretcher:* exerciser spreads legs and bends forward at the waist with head up. Partner faces exerciser and places hands behind the exerciser's neck. Exerciser attempts to stand upright while partner pulls downward.

6. *Leg stretcher:* exerciser lies on back with arms at side and legs extended. Partner straddles exerciser placing feet alongside the ankles of the exerciser. Exerciser tries to spread legs. Vary the exercise by placing the partner inside the exerciser's legs and having the exerciser try to bring legs together.

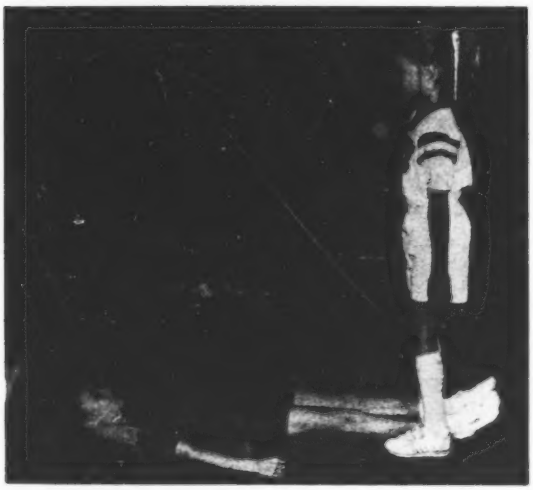

Fig. 5.16. Leg stretcher.

7. *Knee curl:* exerciser lies on stomach with legs straight, arms extended forward. Partner places hands on the back of the exerciser's ankles. Exerciser attempts to bend the leg at the knee joint. Try in the opposite direction with knee joint beginning at a 90-degree angle.

8. *Slow elevator:* exerciser assumes the down push-up position. The partner places hands on the upper back of the exercise and applies minimal resistance as the exerciser completes a push-up.

A recommended companion activity for partner resistance exercises is Grass Drills. This is a strenuous routine in which the students move rapidly from a running in place position to a down position on the grass or floor. Grass Drills have the potential to provide the endurance benefits not received from partner resistance exercises. When teaching Grass Drills, remember:

1. The three basic positions are running place, lying on the stomach, and lying on the back. Specific commands should be used to move students from one position to another (i.e., "Go" signals running in place, "Front" signals moving to the prone position, and "Back" signals moving to a supine position).

2. Since the drills are executed in place, any type of formation is appropriate.

3. Varying the running place movement (i.e., arms to the side, arms above head, heels to seat, etc.) increases interest.

4. Cardiovascular benefits can be increased by lengthening the running in place segment.

Exercise Routine

Exercise	Repetitions or Time
Grass Drills	20-30 seconds
Arm Curl (6-8 counts)	3-5 repetitions per partner
Grass Drills	20-30 seconds
Turtle Shell (6-8 seconds)	3-5 repetitions per partner
Grass Drills	20-30 seconds
Fist Pull Apart (6-8 counts)	3-5 repetitions per partner
Grass Drills	30-40 seconds
Leg Stretcher (6-8 counts)	3-5 repetitions per partner
Grass Drills	30-40 seconds
Sit-ups	10-15 repetitions or 45 seconds
Eagle (6-8 counts)	3-5 repetitions per partner
Back Stretcher (6-8 counts)	3-5 repetitions per partner
Grass Drills	20-30 seconds
Slow Elevator (6-8 counts)	3-5 repetitions per partner
Grass Drills	10-20 seconds
Knee Curl (6-8 counts)	3-5 repetitions per partner

Rope Jumping

Rope jumping has become one of the more popular activities in elementary physical edu-

cation programs. Youngsters throughout the country are quickly discovering that rope jumping can be both challenging and fun. Due to its vigorous and continuous nature, rope jumping also places demands on the cardiovascular system which can be sufficient to cause a training effect. While previously mentioned as companion activity for selected exercise, a special section describing a progression of selected single rope jumping activities can serve as the foundation of a number of additional fitness routines.

Suggested Rope Jumping Activities

1. Jump in place to a specified rhythm (music, tom-tom) without using a rope.
2. Stretch the rope on the floor. Practice jumping back and forth over the rope.
3. Hold both ends of the rope in one hand and turn it so a steady rhythm can be made through a consistent turn. Just before the rope hits the floor, the jump should be made.
4. Holding the rope in both hands, swing the rope back and forth like a pendulum, jumping over the rope as it comes down toward the feet.
5. Start jumping the rope one turn at a time. Gradually increase the number of turns.
6. Introduce the two basic rhythms: slow time and fast time. Slow time is when the jumper takes a rebound step after the rope has been jumped. Fast time occurs when no rebound step is taken between jumps. Children should be encouraged to practice rope jumping stunts in either slow or fast time.
7. Hop on one foot. This may be done continuously on one foot for a specified number of beats, then change to the other foot.
8. Combine hopping and jumping. Turn the body as you jump.
9. Stride jump. Assume a stride position with one foot in front of the other. Both feet should leave the floor simultaneously as the rope completes its downward motion. Vary the stunt by reversing the position of the feet during the jump.
10. Rocker step. Assume a stride position with one foot in front of the other. Swing the rope forward passing it first under the front foot while rocking backward on the rear foot, the rear foot while rocking forward on the front foot.
11. Cross legs. As the rope passes under the feet, the jumper spreads the legs in a straddle position to take the rebound. On the next pass of the rope, the jumper jumps into the air and crosses the feet to take the rebound.
12. Toe touch forward. The jumper swings the right foot forward as the rope passes under the foot and touches the right toe on the floor. Alternate feet and touches.
13. Shuffling. The jumper pushes off the right foot and sidesteps to the left as the rope passes under the feet. Repeat the step to the opposite direction.
14. Skier's jump. The jumper stands on either side of a line on the floor. With feet together, the jumper jumps from one side of the line to the other while the rope passes under the feet.
15. Heel click. The jumper performs a heel click during the upward flight of the jump over the rope.
16. Foot circle. Holding both handles of the rope in one hand and bending forward, the jumper moves the rope in a circular manner (parallel with the floor) passing it under one foot and then the other.
17. Crossing arms. As the rope passes overhead beginning its downward path, the jumper crosses the arms in front and jumps the rope with arms crossed. Repeat, or practice crossing and uncrossing arms while jumping.
18. Double jump. A double jump is completed when the rope passes under the feet twice on the same jump.

Sport Related Fitness Activities

Many sport drills can be modified to increase the fitness demands placed on students. An advantage of sport related fitness activities is that many children are highly motivated by sport activities. This may cause them to put forth a better fitness effort since they enjoy the activity. Thoughtful preplanning and creative thinking can result in drills which teach sport skills as well as provide fitness benefits. The following are some examples of fitness adaptations of sports skills:

Baseball/Softball

1. *Base running:* set up several diamonds on a grass field. Space the class evenly around throughout the base paths. On signal, they run to the next base, round the base, take a lead, then run to the next base. Faster runners may pass on the outside.

2. *Most lead-up games:* children waiting on deck to bat and those in the field perform selected activities (skill or fitness related) while waiting for the batter to hit.

3. *Position responsibility:* start children at various positions on the field. On command, children are free to quickly move to any other position. Upon reaching that position, the child is to display the movement most frequently practiced at that position (i.e., shortstop fields ball and throws to first base). Continue until all players have moved to each position.

Basketball

1. *Dribbling:* each child has a basketball or playground ball. Assign one or more people to be "it". On command, everyone begins dribbling the ball and avoids being tagged by those who are "it". If tagged, that child becomes the new "it". A variation would be to begin the game by "its" not having a ball. Their objective would be to steal a ball from classmates.

2. *Dribbling, passing, rebounding, shooting, and defense:* using the concept of a circuit, assign selected basketball skills to be performed at each station. Be sure there is ample equipment at each station to keep all youngsters active. Movement from one station to another should be vigorous and may include a stop for exercise.

3. *Game play:* divide the class into four teams. Two teams take the court and play a game of basketball. The other teams assume a position along respective sidelines, and practice a series of exercises. The playing and exercising teams change positions at the conclusion of the exercise sequence.

Football

1. *Ball carrying:* divide the class into 4-6 squads. The first person in line carries the ball while zig-zagging through preplaced boundary cones. The remainder of the squad performs a specific exercise. Upon completing the zig-zag course, the first person hands off to the next person in line. This hand-off signifies a change in exercise for the remainder of the squad.

2. *Punting:* with partners, one child punts the ball to the other. After the receiver has the ball, the object is to see which child can get to their partner's starting position first. Repeat, with the receiver becoming the punter.

3. *Forward passing:* divide the children into groups of no more than four. Children practice running pass patterns. Rotate the passing responsibility after every 6 throws.

Volleyball

1. *Rotating:* place youngsters in the various court positions. Teach them the rotational sequence. As they reach a new court position, have them complete several repetitions of a specific exercise. On command, rotate to the next position. Select activities which exercise components of fitness to enhance volleyball skill development.

2. *Serving:* divide the class evenly among available volleyball courts. Starting with an equal number of children on each side of the net, begin practicing the serve. At the conclusion of each successful serve, the child runs around the net standard to the other side of the net and retrieves a ball and serves.

3. *Bumping and setting:* using the concept of the circuit, establish several stations to practice the bump and set. Movement from station to station should be vigorous and may contain a special stop for exercise.

Soccer

1. *Dribbling:* working with a partner, have one child dribble the ball around the playground with the partner following close behind. On signal, reverse roles.

2. *Passing and trapping:* working with partners or small groups, devise routines which cause the players to continuously move, i.e., jogging, running in place, performing selected exercises while waiting to trap and pass the soccer ball.

3. *Game play:* divide the class into teams of 3 or 4 players per team. Organize the playground area to accommodate as many soccer fields as necessary to allow all teams to play. Make the fields as large as possible.

Sport Skills Circuit

By combining sport skills with the principles of FIT, a wide variety of fitness routines can be developed. The following routine is an example of sport skills incorporated into an eight

station outdoor circuit.

Station 1, soccer dribble: using only the feet, dribble the soccer ball to a predetermined point and back as many times as possible in the time provided.

Station 2, basketball chest pass: with a partner, practice the chest pass. To place additional demands on the arm muscles, increase the distance of the pass.

Station 3, football lateral: moving up and down the field, children practicing lateralling the ball to one another.

Station 4, softball batting: each child has a bat and practices proper swing technique. Be sure to allow ample space between hitters.

Station 5, continuous running long jump: children take turns practicing the running long jump. After one child successfully completes a jump, the next one begins running down the runway. The activity should be continuous, with station members always moving.

Station 6, soccer inbounds pass: with partners, practice the overhead inbounds pass. Keep the ball overhead and propel the ball forward with a flick of the wrist and proper arm motion.

Station 7, field hockey passing: with partners pass the field hockey ball back and forth between partners while moving up and down the field.

Station 8, fielding a softball: with partners, practice fielding a thrown ground ball. Make the activity more challenging by throwing the ball so the partner has to move to field the ball.

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